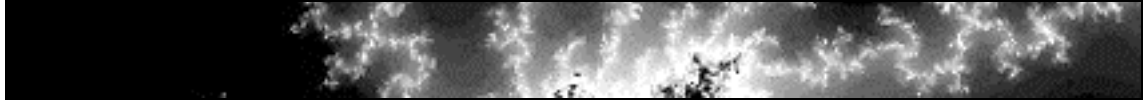


PSYCHOLOGY AND FARCE



This chapter will discuss the developing theoretical synthesis of chaos theory and psychology, and will examine how this discourse may be used by literary criticism to critique the representation of human behaviour in contemporary novels. Psychologists who are expert in this area argue that their interpretation of chaos theory is motivated by their discipline's inability to explain the unpredictable, nonlinear events that shape human experience, and that chaos theory's human-oriented perception of causality establishes a set of principles which may enable them to more effectively interpret the chance events, accidents, and coincidences that figure prominently in human lives.¹ Tori DeAngelis, for example, argues in "Chaos, Chaos Everywhere is what the Theorists Think" (1993) that a synthesis of chaos theory and psychology is far more suited to interpreting nonlinear human behaviour than psychological theories that do not take current understandings of complex dynamical systems into account.²

Another psychologist, Albert Bandura, explains in "The Psychology of Chance Encounters and Life Paths" (1982) that "psychology cannot shed much light on the occurrence of fortuitous encounters, but it can provide the basis for predicting the impact they will have on human lives."³ For psychology, chaos theory is significant because of its ability to explain how fortuitous events occur. David R. Mandel argues in

¹ For an introduction to the psychological interpretation and application of chaos theory see Frederick David Abraham and Albert R. Gilgen, eds., *Chaos Theory in Psychology*, Westport: Greenwood Press, 1995. The principles of chaos theory are relevant to human systems because, as Davies and Gribbin argue, chaos theory provides a bridge between the laws of physics and the laws of chance. See Davies and Gribbin, *The Matter Myth*, pp. 2, 35.

² Tori DeAngelis quotes the co-founder of the Society for Chaos Theory in Psychology, Dr. Larry Vandervert, as saying that the basic ideas of chaos theory "will permeate the entirety of psychology in the next four to five years." While this bold statement may appear a little over-confident, it does suggest that a significant new factor is at work in psychological discourse. See DeAngelis, "Chaos, Chaos Everywhere is what the Theorists Think," in *American Psychological Association Monitor*, Volume 24, No. 1, 1993, pp. 1+.

³ Albert Bandura, "The Psychology of Chance Encounters and Life Paths," in *American Psychologist*,

“Chaos Theory, Sensitive Dependence, and the Logistic Equation” (1995) that “Bandura’s notion that people’s life paths can be profoundly influenced by fortuitous events shares many similarities with the concept of sensitive dependence [on initial conditions].”⁴ Mandel establishes the fundamentals of chaos psychology when he argues that the individual may be defined “as a sensitively dependent system.”⁵ Psychologists hypothesise that by combining the strengths of chaos theory and psychology, new and innovative ideas about the effects of deterministic chaos on human lives may be developed.

In addition to instigating a notable development in its discourse, the psychological appropriation of chaos theory may have meaningful implications for literary criticism, especially for the ways in which the behaviour of fictional characters is interpreted. This chapter will employ the discourse of chaos psychology to examine the psychological implications of deterministic chaos in several recent novels. Of course, the critical use of psychological discourse is not a new or unsubstantiated methodological phenomenon in twentieth-century literature. On the contrary, it is an established practice: the product of Sigmund Freud’s psycho-analytic discourse, Lacanian and post-Lacanian thought, and feminist critiques. Freud’s use of the narrative form to encapsulate psychological discussions, such as in case studies like ‘Dora,’ has led to an increasingly self-conscious psychology of narrative.⁶ The narration of psychological critiques has become common, and the fictional representation of psychological conditions has also become a literary norm. In previous chapters this thesis has discussed the literary use of chaos theory to examine chaotic plot structures: the physical structures of narratives. This chapter will employ chaos psychology to examine the chaotic behaviour of fictional characters: the psychological structures of narratives.

The application of chaos psychology to analyse fictional behavioural characters has been influenced to a considerable extent by the views of Isla Lonie, who discusses

Volume 37, No. 7, 1982, pp. 747-55, p. 747.

⁴ David R. Mandel, “Chaos Theory, Sensitive Dependence, and the Logistic Equation,” in *American Psychologist*, Volume 50, No. 2, 1995, pp. 106-7, p. 106. Mandel is more cautious than Vandervert, and suggests that “it is premature at this point [1995] to claim that nonlinear dynamical systems theory will offer psychology a new paradigm”, but that it can at least “offer some new conceptual insights.” p. 107.

⁵ *Ibid.*, p. 106.

⁶ Sigmund Freud, *Case Histories I: ‘Dora’ and ‘Little Hans’*, The Penguin Freud Library Volume 8,

the role of the therapist in identifying the complex patterns buried within patient behaviour in “Chaos Theory: A New Paradigm for Psychotherapy” (1991). Lonie argues that an analogy may be drawn between the role of the therapist, who ‘reads’ the behaviour of the patient, and the literary reader, who ‘reads’ the behaviour of fictional characters. This analogy is fundamental in facilitating the opening of narrative systems to analysis based on the principles of chaos psychology. The processes of psychotherapy and reading are also analogous in that the psychologist and the reader can only observe behaviour retrospectively: they must wait for repetition to become evident in patients’ or characters’ behaviour before analysis can occur.⁷ Lonie further suggests that chaos theory is useful in psychology not merely in structural terms, but that it also has thematic value. She argues that patients are aware of chaos in their lives, and that this awareness takes the form “of overwhelming complexity in which it is not possible to understand anything.”⁸ The psychological appropriation of chaos depends strongly on the metaphysical and mythological implications of chaos. Psychology’s use of chaos theory focuses not only on the effects of chaos, but on developing an understanding of chaos as a basic property of human systems.

The first section of this chapter will discuss the application of chaos theory to psychology, and will refer to psychological interpretations of chaos theory developed by June Singer, Mark D. Michaels, Marshall P. Duke, and Michael R. Butz. The second section will apply the newly defined discourse of chaos psychology to two novels by Don DeLillo: *White Noise* and *Americana*.⁹ Butz hypothesises that the concept of chaos figures as anxiety in the psyche, and through this metaphor he argues that it causes a form of psychological fragmentation whereby people become unable to deal with their complex and chaotic surroundings. Butz’s argument is convergent with the argument presented in the previous chapter in the context of current evolutionary theory - that human beings demonstrate the ability to evolve towards their own extinctions. The distinguishing feature of Butz’s discourse, however, is that it expresses this theory in

London: Penguin, 1990.

⁷ Isla Lonie, “Chaos Theory: A New Paradigm for Psychotherapy,” in the *Australian and New Zealand Journal of Psychiatry*, Volume 25, No. 4, 1991, pp. 548-60, p. 556.

⁸ *Ibid.*, p. 555.

⁹ Don DeLillo, *White Noise*, London: Picador, 1986, and *Americana*, New York: Penguin, 1971.

psychological terms. The aim of this section is to develop a new interpretation of the chaotic psychological circumstances in *White Noise* and *Americana*.

The third section will examine an interpretation of chaos as farce, and will refer to the texts of Jean Baudrillard, Octavio Paz, Eric Charles White, and Jessica Milner Davis. It will provide an alternative vision to the depressing perception of the human condition expressed through the perspective of chaos psychology. Whereas a psychological reading of chaotic events offers a despairing view of humanity, a reading of chaotic events as farce may promote a humorous acceptance of human limitations and imperfections. This interpretation of chaos as farce will demonstrate how the study of fictional narratives may be further opened through the critical application of chaos theory, and will consider the implications of the satirical characterisation of chaologists in Robert Littell's *The Visiting Professor* and Crichton's *Jurassic Park*. It will also discuss Sokal's use of satire to destabilise literary interpretations of chaos theory, and reflect on why satire occupies such an important place in literary and scientific discourse in the context of the science wars.

CHAOS PSYCHOLOGY

To properly understand the discourse of chaos psychology, critics require a specific, psychologically oriented, definition of chaos. This is provided by the psychologist June Singer, who defines chaos in *Seeing Through the Visible World: Jung, Gnosis, and Chaos* (1990) as a concept that:

stands for all that the human mind has not been able to fit into some kind of order or some set of rules or propositions that assure us that nature is systematic and predictable. Everyone has to deal with chaos in life, in the form of the incomprehensible, the unpredictable, the irrational, the confused aspects of personal and natural existence.¹⁰

Chaos is an unsettling psychological phenomenon that is an inevitable and unavoidable part of human experience. The discourse of chaos psychology focuses on the ways in which people deal with chaos, and the behaviour they exhibit when they fail inevitably to cope with chaos. Singer argues that we have two choices when dealing with chaos: the

¹⁰ June Singer, *Seeing Through the Visible World: Jung, Gnosis, and Chaos*, New York: Harper and Row, 1990, p. 63.

first choice is to pretend that disorder is quashed by order; the second choice involves accepting that disorder is the predominant state of being in the universe and that order is a mere exception to disorder. In comparison to the ‘easy’ solution of avoiding chaos, Singer argues that the “more difficult way is to face the reality of chaos and to ask of disorder in nature the same question that [Carl] Jung asked concerning the minds of disturbed people: Can some kind of order be hidden deep within chaotic systems?”¹¹

Jung’s question is answered in the affirmative by chaos psychology, which proposes that disordered human behaviour is not random but complexly ordered. It establishes an analogy between complex systems and the human psyche which defines seemingly irrational and illogical human behaviour as the product of multiple initial conditions. This analogy is an essential feature of Mark D. Michaels’ argument in “The Chaos Paradigm” (1989) that human behaviour is inherently chaotic.¹² This is not simply an assertion of the obvious, but a fundamental recognition that human behaviour follows the same types of patterns as other types of complex open systems. To further this analogy, psychologists identify factors like emotion, reason, memory, and experience as strange attractors in human behavioural systems. Chaos psychology provides two reasons for defining human behaviour as indeterminate: firstly, it suggests that indeterminate human behaviour is the product of a chaotic psyche; and secondly, that it is the product of indeterminate environmental conditions. These hypotheses have important implications for the ways in which critics examine fictional events.

In *Chaos, Catastrophe, and Human Affairs* Stephen J. Guastello considers the notion that human behaviour is fundamentally indeterminate. He describes the influence of environmental forces on human behaviour by arguing that the responsibility for any accident rests less with the individual who experiences it than with the group dynamics and the organisational processes that surrounded the individual and which influenced their behaviour.¹³ A typical accident, such as a car crash, can be interpreted as the result of a number of interacting forces. These forces include the ability and state of mind of

¹¹ *Ibid.*, p. 63.

¹² Mark D. Michaels, “The Chaos Paradigm,” in *Organisation Development Journal*, Volume 7, No. 2, 1989, pp. 31-5, p. 32.

¹³ Stephen J. Guastello, *Chaos, Catastrophe, and Human Affairs: Applications of Nonlinear Dynamics to Work, Organizations, and Social Evolution*, Mahwah: Lawrence Erlbaum Associates, 1995, p. 206.

the driver, the mechanical state of the vehicle, and various environmental circumstances like prevailing weather conditions. The application of this hypothesis to the circumstances of a car crash suggests that if an observer is unable to determine or account for all of these forces then the events that result cannot simply be identified as the direct effect of the driver's behaviour: they are the product of the combination of the driver's behaviour and prevailing environmental conditions.

The definition of human behaviour as chaotic is examined by Marshall P. Duke, who argues in "Chaos Theory and Psychology: Seven Propositions" (1994) that human behaviour is characteristic of the operation of chaos theory principles including the butterfly effect or sensitive dependence on initial condition and recursive symmetry. One of the most significant points made by Duke is that human behaviour is both variable and stable. Duke references the chaos theory concept of 'metastability,' which describes how complex systems exhibit both stable and unstable behaviour: remaining in stable or quasi-stable states for long periods of time, before changing suddenly or bifurcating when perturbed. He considers chaos psychology's analysis of human behaviour in relation to open systems theory as a useful method of examining how common or 'normal' behaviours can bifurcate into unusual or 'abnormal' behaviours.¹⁴

What happens when people react to chaos, particularly when their reaction is other than an acceptance of it, is the subject of the work of Michael R. Butz. In "Chaos, an Omen of Transcendence in the Psychotherapeutic Process" (1992) Butz constructs a metaphor that describes the human reaction to chaos as one of anxiety, and argues from this metaphor that the concept of chaos represents overwhelming anxiety at the disorder of life.¹⁵ In "Practical Applications from Chaos Theory to the Psychotherapeutic Process, a basic consideration of dynamics" (1993) Butz further focuses on the concept of anxiety, which he defines as the most common human response to chaos.¹⁶ Whereas Duke simply identifies the influence of chaos on psychological processes, Butz specifically considers how the analogy of the butterfly effect may be employed in

¹⁴ Marshall P. Duke, "Chaos Theory and Psychology: Seven Propositions," in *Genetic, Social, and General Psychology Monographs*, Volume 120, No. 3, 1994, pp. 267-86, p. 268.

¹⁵ Michael R. Butz, "Chaos, an Omen of Transcendence in the Psychotherapeutic Process" in *Psychological Reports*, Volume 71, December 1992, pp. 827-43, p. 828.

¹⁶ Butz, "Practical Applications from Chaos Theory to the Psychotherapeutic Process, a basic

psychological discourse to examine how the mind operates. Butz's theory of chaos as anxiety reflects Paz's theory of the Accident: Paz states in *Conjunctions and Disjunctions* that "the Accident terrifies us" and leave us unable to rationalise away its traumatic consequences.¹⁷ The terror inspired by the Accident corresponds to the anxiety inspired by chaotic events.

The concept of the sensitive dependence on initial conditions indicates that small causes may be catalysts of collapse, pushing complex systems over 'the edge of chaos' into disorder. Butz argues in "Chaos, an Omen of Transcendence" that the mind is like any other open system in that it is extremely sensitive to its initial conditions and to perturbations.¹⁸ Initial, perhaps trivial, events may be transformed and enlarged within the mind into a major catastrophe. Consequently, one small event can drastically change an individual's behaviour. For example, a minor stress could lead to a major reaction, such as a violent expression of anger or an attack of anxiety. The psychological sensitivity to initial conditions suggests that human behaviour cannot be modelled on linear causal models, for it is potentially so complex that it cannot be predicted at all, only described retrospectively. Chaos psychology defines human behaviour as inherently nonlinear and suggests that reactions to stress and other psychological perturbations may be out of all proportion to their causes. Butz's theory that chaos represents anxiety in human psychological processes is his most important contribution to the growing discourse of chaos psychology. It will be referred to throughout this chapter.

CHAOS AS ANXIETY

Butz's metaphor of chaos as anxiety may be used to examine the behaviour of fictional characters, who are often involved in situations that they do not understand, and which are beyond their control. Rising levels of stress result from their inability to moderate and understand social conditions. Increasing psychological perturbation leads to a critical or bifurcation point when characters cannot cope with their chaotic surroundings. Faced

consideration of dynamics" in *Psychological Reports*, Volume 73, October 1993, pp. 543-54, p. 544.

¹⁷ Paz, *Conjunctions and Disjunctions*, p. 112.

¹⁸ Butz, "Omen of Transcendence," p. 831.

with obvious, unavoidable chaos, characters often exhibit anxiety and fear in response: their psychological states collapse into erratic disorder. Butz's chaos as anxiety analogy is particularly suited to framing a critique of the behaviour of Jack Gladney and his family in Don DeLillo's *White Noise*. Jack, chairman of the department of Hitler studies at Blacksmith College, is the focal character of *White Noise*, a complex comic novel that describes a dense information-driven world within which chaos, catastrophe and information are fundamental properties. The pivotal event in *White Noise* occurs when the Gladney's town of Blacksmith is threatened by a toxic chemical spill, known as the 'airborne toxic event,' and the inhabitants are forced to evacuate.

The previous chapter indicated that the narration of environmental catastrophes is becoming increasingly common, and suggested that a critical response to the literary preoccupation with disasters is beginning to develop. Given that the environmental catastrophe of the airborne toxic event is such a significant event in *White Noise*, it is reasonable to examine it here in the context of chaos psychology. In his Introduction to *New Essays on White Noise* (1991) Frank Lentricchia argues that "DeLillo does not produce happy evaluations of the effects of large public pressures on individuals" - the pressures placed on characters in novels like *White Noise* tend to produce negative outcomes.¹⁹ Lentricchia acknowledges that "[t]he central event of *White Noise* is an ecological disaster," but his critique does not come to terms with the significance of the airborne toxic event.²⁰ Recent criticism of *White Noise* has focused on its representation of consumer culture, the electronic media, the meaning of death, and its satirical perception of academia. DeLillo's representation of information theory and chaos theory, and the relationship between these ideas and environmental catastrophes, remains to be thoroughly examined.

In "Adolf, We hardly Knew You" (1991) Paul A. Cantor discusses the concept of the disaster in relation to *White Noise*, and suggests that "reality has repeatedly found ways to outdo [DeLillo's] imagination, as the Bhopal disaster exceeded the airborne toxic event in *White Noise*."²¹ The issue of 'life imitating art' in DeLillo's fiction is a

¹⁹ Frank Lentricchia, Introduction to *New Essays on White Noise*, edited by Frank Lentricchia, Cambridge: Cambridge University Press, 1991, p. 4.

²⁰ *Ibid.*, p. 7.

²¹ Paul A. Cantor, "Adolf, We hardly Knew You," in *New Essays on White Noise*, pp. 39-62, pp. 51-2.

fascinating one, yet Cantor progresses from this observation without examining how the environmental catastrophe in *White Noise* relates to real events. The correlation between fictional and actual nuclear disasters was discussed in the previous chapter, where it was suggested that the practice of examining fictional disasters as a response to the prevalence of real disasters is extremely useful in developing an understanding of novels like *Jurassic Park*. There is sufficient correlation between the ecological catastrophe in *White Noise* and real events, such as Bhopal, to warrant further study in this area, yet neither Cantor nor Michael W. Messmer, who argues in “‘Thinking it through completely’: The Interpretation of Nuclear Culture” (1988) that *White Noise* “uncannily anticipated the Bhopal disaster in India,” thoroughly examine its reflection of contemporary concerns about chaotic environmental circumstances.²²

The prevalence of information in the form of mindlessly repeated television advertisements in *White Noise* also warrants further discussion. Leonard Wilcox argues in “Baudrillard, DeLillo’s *White Noise*, and the End of Heroic Narrative” (1991) that *White Noise* defines “a culture based on the mode of information” but he does not closely examine the characteristics of information in *White Noise*, and does not refer to information theory.²³ Moreover, Wilcox defines *White Noise* as the fictional fulfillment of Baudrillard’s theories, but does not consider his appropriation of chaos theory in relation to the chaos referents in *White Noise*. This hesitancy to discuss scientific ideas is also characteristic of Lentricchia’s “Tales of the Electronic Tribe” (1991), which examines the social context of noise, but does not consider its scientific definition.²⁴ Nevertheless, “Tales of the Electronic Tribe” is useful in describing the “deep plot” of *White Noise*, which is representative of the hidden order of deterministic chaos: its plot mimics the butterfly effect by exponentially magnifying Jack’s minute psychological uncertainties into events of massive proportion.²⁵ The meaning of events in *White Noise* emerges when the process by which they are created, the sensitive dependence on initial conditions, is understood.

²² Michael W. Messmer, “‘Thinking it through completely’: The Interpretation of Nuclear Culture,” in *The Centennial Review*, Volume 32, No. 4, 1988, pp. 397-413, p. 403.

²³ Leonard Wilcox, “Baudrillard, DeLillo’s *White Noise*, and the End of Heroic Narrative,” in *Contemporary Literature*, Volume 32, No. 3, 1991, pp. 346-65, p. 363.

²⁴ Lentricchia, “Tales of the Electronic Tribe,” in *New Essays on White Noise*, pp. 87-113, p. 100.

A critic who does consider the implications of the environmental disaster in *White Noise* is Michael Valdez Moses, who examines the correlation between real and fictional ecological disasters in “Lust Removed from Nature” (1991). Moses argues that:

The more vigorously man pursues the ultimate dream of modern technological science - the conquest of the final natural limit, death - the more rapidly that dream seems to recede and the more imminent seems the historically unprecedented nightmare that technology visits upon man.²⁶

Moses establishes that the airborne toxic event possesses traces of congruity with historical events such as Bhopal. Moses discusses how ecological disasters effect people psychologically as well as physically, and his critique of the inherently paradoxical nature of modern science and technology reflects Baudrillard’s critique of the same subject in *The Transparency of Evil*. What is important about Moses’ comments is that he notes, with reference to Heidegger, that “the danger of technology” has more impact “on the metaphysical than on the physical” experience of characters in *White Noise*.²⁷ The paradox of deterministic chaos has a greater impact on the minds than the bodies of Jack Gladney and his family: they emerge from the airborne toxic event physically unscathed but are extremely mentally perturbed.

The one critic who does refer to chaos theory in relation to DeLillo is Stephen Bernstein, who argues in “*Libra* and the Historical Sublime” (1994) that chaos theory provides a useful frame of reference for examining complex, ambiguous narrative events. He suggests that in *Libra* DeLillo constructs “a model of history beholden to theories of chaos and the lack of certainty which has haunted Western science throughout this century.”²⁸ This model is “not acausal but too complex, too immense, to be reckoned by the unitary subjective mind.”²⁹ Bernstein defines the unpredictability of historical events in relation to the sublime, and argues that “DeLillo signifies the operation of history through the sublime.”³⁰ To Bernstein, *Libra* “makes the same case for history that chaos

²⁵ *Ibid.*, p. 103.

²⁶ Michael Valdez Moses, “Lust Removed from Nature,” in *New Essays on White Noise*, pp. 63-86, pp. 70-1.

²⁷ *Ibid.*, p. 71.

²⁸ Stephen Bernstein, “*Libra* and the Historical Sublime,” in *Postmodern Culture*, Volume 4, No. 2, 1994. jefferson.village.virginia.edu/pmc/issue.194/bernstei.194.html (8 Oct 1996).

²⁹ *Ibid.*

³⁰ *Ibid.*

theory has clarified about weather forecasting: the impossibility of grasping the plurality of details inherent in initial conditions renders any human attempt at understanding the present or forecasting the future proportionally deficient.”³¹ While Bernstein focuses on *Libra*, his comments are equally applicable to *White Noise*.

White Noise is intimately involved in defining the social contexts of chaos. In one of its most memorable scenes, Jack comments that:

They had to evacuate the grade school on Tuesday. Kids were getting headaches and eye irritations, tasting metal in their mouths. A teacher rolled on the floor and spoke foreign languages. No one knew what was wrong. Investigators said it could be the ventilating system, the paint or varnish, the foam insulation, the electrical insulation, the cafeteria food, the rays emitted by micro-computers, the asbestos fireproofing, the adhesive on shipping containers, the fumes from the chlorinated pool, or perhaps something deeper, finer-grained, more closely woven into the basic state of things (35).

This intangible substance so closely woven into the fabric of life can be thought of as chaos. In this scenario, Jack defines a list of possible causes, yet none can be obviously considered to be the primary cause of these events. He believes that tests conducted to determine the cause of this event are inconclusive and “ambiguous” (35), and considers a linear explanation of these events to be unsatisfactory, preferring instead an intangible, nonlinear explanation associated with the immaterial structure of the universe, the “basic state of things.”

In another significant scene, Jack Gladney and his family gather together at home to watch footage of disasters on television:

That night, a Friday, we gathered in front of the set... There were floods, earthquakes, mud slides, erupting volcanoes. We’d never before been so attentive to our duty, our Friday assembly... Babette tried to switch to a comedy series about a group of racially mixed kids who build their own communications satellite. She was startled by the force of our objection. We were otherwise silent, watching houses slide into the ocean, whole villages crackle and ignite in a mass of advancing lava. Every disaster made us wish for more, for something bigger, grander, more sweeping (64).

For the Gladney family, this disaster footage is “entertaining” (65). The television programs that interest the Gladneys the most are those that contain images of natural disasters, accidents, and human tragedies. The effect of this constant bombardment of disaster information is to make the catastrophe a constant feature of Jack’s consciousness. According to Baudrillard in *The Illusion of the End*, “the media live off

³¹ *Ibid.*

the presumption of catastrophe and of the succulent imminence of death.”³² Consumers of disaster information like Jack come to live off the destructive excess of the representation of chaos and catastrophe. This is confirmed by one of Jack’s colleagues, Alfonse Stompanato, who believes that the fascination with catastrophes occurs:

Because we’re suffering from brain fade. We need an occasional catastrophe to break up the incessant bombardment of information... The flow is constant... Words, pictures, numbers, facts, graphics, statistics, specks, waves, particles, motes. Only a catastrophe gets our attention. We want them, we need them, we depend on them (66).

Alphonse qualifies this statement by arguing that the catastrophes that “happen somewhere else” and to someone else stimulate our minds (66). The experience of viewing disasters on television fosters a form of euphoria in the viewer, who has been able to witness a disaster, survive, and not suffer the consequential perturbation and anxiety of a real disaster.

Douglas Keesey discusses Jack Gladney’s fascination with disaster information in *Don DeLillo* (1993), and suggests that through watching disasters on television that the Gladney family has become “indifferent to the painful reality of actual suffering.”³³ Alphonse informs Jack that some of the best disasters and catastrophes are produced in third world countries for export via the media to the first world: “India remains largely untapped. They have tremendous potential with their famines, monsoons, religious strife, train wrecks, boat sinkings, et cetera” (66). Baudrillard declares in *The Illusion of the End* that “poor countries” like Bangladesh “are the best suppliers” of “human and natural catastrophes.”³⁴ This idea forms the basis of Jack’s analysis of the availability of televised disaster footage. Jack is not overtly concerned with the feelings of those who experience the events he observes on television, or with issue of the representation and consumption of images of human suffering: he is mainly interested in the representation of chaos, in being able to observe chaos without actually suffering its effects.

The pleasurable consequence of viewing disaster film is also discussed by Baudrillard, who argues in *Cool Memories II* that the euphoria the viewer of disaster information experiences is a form of *jouissance*: he proposes that we should recognise

³² Baudrillard, *The Illusion of the End*, p. 55.

³³ Douglas Keesey, *Don DeLillo*, New York: Twayne, 1993, p. 142.

³⁴ Baudrillard, *The Illusion of the End*, p. 68.

catastrophes as a cause of *jouissance*, and appreciate them accordingly.³⁵ In her Introduction to *The Disaster File: The 1970's* (1980) Grace M. Ferrara argues that the interest people have in disasters is due to the realisation that those who witness accidents and catastrophes are survivors of these events. The joy and fascination people experience in these circumstances is not simple pleasure but the relief of survival.³⁶ The desire to consume information about accidents for pleasure is therefore predicated on the lack of immediate personal experience. The experiential distance between those who experience accidents and those who consume information about them is determined by the media.

The appreciation of disasters is firmly located within the context of television and other forms of vicarious experience, and does not apply to actual or first-hand experiences. When a real catastrophe occurs to the Gladneys, their behaviour is very different to their earlier fascination and amusement; their experience of a real disaster is an example of Butz's analogy of chaos as anxiety. When the airborne toxic event occurs, and Blacksmith's residents are forced to evacuate their homes, fear and panic sets in. Jack describes the toxic gas thus:

...the black billowing cloud... moved like some death ship in a Norse legend... It was a terrible thing to see, so close, so low, packed with chlorides, benzines, phenols, hydrocarbons, or whatever the precise toxic content. But it was also spectacular, part of the grandness of a sweeping event... Our fear was accompanied by a sense of awe that bordered on the religious. It is surely possible to be awed by the thing that threatens your life, to see it as a cosmic force, so much larger than yourself, more powerful, created by elemental and wilful rhythms. This was a death made in the laboratory, defined and measurable, but we thought of it at the time in a simple and primitive way, as some seasonal perversity of the earth like a flood or a tornado, something not subject to control (127).

Jack is awed, terrified, and unable to cope with the reality of his experience. Messmer argues in "Thinking it through completely" that the Gladney family "become the *subjects* of a disaster... thus reversing the position they (and we) normally assume of being *observers* of disasters."³⁷ As a result of this reversal, their behaviour comes to reflect the behaviour predicted by chaos psychology.

³⁵ Baudrillard, *Cool Memories II*, pp. 48-9.

³⁶ Grace M. Ferrara, Introduction to *The Disaster File: The 1970's*, edited by Grace M. Ferrara, London: Macmillan, 1980, p. 1.

³⁷ Messmer, "Thinking it through completely," p. 403.

The discourse of chaos psychology indicates that the actual physical events of disasters have less psychological influence on those who experience them than what people believe has occurred; Baum, for example, argues in “Toxins, Technology, and Natural Disasters” that the information (and disinformation) about an accident is what primarily affects disaster victims.³⁸ He states that “[t]he belief that one has been exposed to toxic substances may cause long-term uncertainty and stress, as well as pose a threat to one’s health.”³⁹ In the case of Jack, proven exposure to a toxic substance does not produce psychological perturbation; rather, it is the mere suspicion of exposure that has severe psychological consequences. According to Baum, the symptoms of experiencing a disaster include fear, anxiety, shock, denial of the experience, depression, and an overriding concern for the fate of family and friends.⁴⁰ Messmer similarly defines the symptoms of experiencing a disaster: “[w]hen a disaster is experienced, or when one is imagined, a complex of emotional responses is triggered: fear, awe, distrust, suspicion, anxiety, depression.”⁴¹ Messmer significantly points out that the responses to real and imagined disasters are psychologically equivalent.

Although Jack and his wife Babette acknowledge that their fear of death preceded Jack’s exposure to the toxic chemical Nyodene D. during the airborne toxic event (15, 30, 47, 100), Jack’s exposure is the pivotal event that triggers obvious anxiety responses in both Jack and Babette. He becomes convinced that he has been exposed to a toxic substance, and then behaves accordingly, even though the extent of his exposure remains ambiguous. The airborne toxic event functions as a bifurcation point in their lives: their psychological states are fundamentally challenged and destabilised, and their fear of death is greatly enlarged by the accident and their inability to cope becomes obvious. Symptoms of anxiety and stress may be seen in the behaviour of the Gladney family during and after the airborne toxic event: they feel “subdued, worried, confused” (123). The effects of the disaster determine the course of their lives.

One way of examining their response to the toxic airborne event is to argue that Jack and Babette take what June Singer would consider to be the easy way out of

³⁸ Baum, “Toxins, Technology, and Natural Disasters,” p. 28.

³⁹ *Ibid.*, p. 37.

⁴⁰ *Ibid.*, p. 18.

dealing with the situation; they compare it to a mythological event, a Norse legend, which distances its reality from their own. Carl S. Smith argues in “Urban Disorder and the Shape of Belief: the San Francisco Earthquake and Fire” (1984) that “survivors of any catastrophe seek to restore order” by constructing mythologies that “help to maintain a society’s ideological bearings in an unstable world.”⁴² Jack’s description of the gas cloud as being of mythological proportions fits this scenario perfectly - “...the black billowing cloud... moved like some death ship in a Norse legend...” (127) - he may be unable to ask the more difficult question posed by Singer: to examine the complex circumstances of the event.

Alternatively, we can see in the events that follow the accident the Gladney family’s attempts to come to terms with what has happened to them. They discuss the implications of Jack’s exposure to the airborne toxic event through a prolonged and anguished consideration of death, which in *White Noise* is considered to be the most unpredictable of events. Jack tells his colleague Murray Jay Siskind that “since I was in my twenties, I’ve had the fear, the dread [of death]” (151). Jack’s fear of death is related to the unpredictability of when death will come to him. He believes, due to his exposure to the chemical Nyodene D., that he is “enmeshed” or “deeply involved” in the phenomena of death, that there is no escape from either the poisonous chemical or the chaos that it represents (151). Murray states that it is in the context of life and death that chaos makes itself evident:

We start our lives in chaos, in babble. As we surge up into the world, we try to devise a shape, a plan. There is dignity in this. Your whole life is a plot, a scheme, a diagram. It is a failed scheme but that’s not the point. To plot is to affirm life, to seek shape and control (291-2).

Murray sets out the fundamental perspective of life as a chaotic process, and the human reaction against disorder.

Murray defines a desire to control events, to force an image of order on a disordered world. He suggests that there is dignity in the desire to construct order, but in reality our desire for order constitutes not dignity but desperation: it represents the panic

⁴¹ Messmer, “Thinking it through completely,” p. 412.

⁴² Carl S. Smith, “Urban Disorder and the Shape of Belief: the San Francisco Earthquake and Fire,” in *The Yale Review*, Volume 74, 1984, pp. 79-95, p. 80.

and anxiety we naturally experience when confronted with the chaotic, the complex, and the unknown. Life for Murray is a failed attempt to bring order and control into the world. Whereas in life he admits that the craving for order cannot be satisfied, Murray suggests that death signifies the closure of life and also of chaos:

Even after death, most particularly after death, the search [for order] continues. Burial rites are an attempt to complete the scheme, in ritual. Picture a state funeral, Jack. It's all precision, detail, order, design. The nation holds its breath. The efforts of a huge and powerful government are brought to bear on a ceremony that will shed the last trace of chaos. If all goes well, if they bring it off, some natural law of perfection is obeyed (292).

Our lives are systems embedded in chaos and complexity. We avoid total entropy or thermodynamic equilibrium by digesting food, which lowers our internal entropy at the expense of our environment. When we are no longer physically capable of sustaining this renewal our bodies collapse towards total entropy or death. The closure of a chaotic system indicates that chaos has ceased and the system is at rest. The precision and order of a funeral is a symbolic end to chaotic life.

The toxic gas cloud of the airborne toxic event, which Jack describes as “a national promotion for death” (158), is a sign that “marks the end of uneventful things” for him (151). He implies that the cloud announces the impending end of chaos and the arrival of death. From the time he realises the significance of the cloud, Jack’s fear of death dominates his life: his state of being is dominated by “the death impression of the Nyodene cloud” (154). Jack realises with a shock that he is “technically dead” already due to his exposure to Nyodene D. and an ambiguous diagnosis of his condition by a SIMUVAC technician who is coordinating the evacuation only strengthens his fear (158). Jack becomes possessed by the inevitability yet unpredictability of his own death, develops severe self-pity as he thinks about the “time-factored death” within him (159), and tells us that he is “ready to search anywhere for signs and hints, intimations of odd comfort” (154). His search for comfort can be read as a search for answers and solutions to the uncertainty of his impending death. Jack’s attempts to deal with the chaos of his life initially involve finding a medical solution to the psychological trauma of his exposure.

Jack submits himself to a series of thorough medical tests in an attempt to ascertain the reality of his death, but these tests are unable to predict when he will die (276). The tests do reveal traces of Nyodene Derivative in his bloodstream (279), which

only confirms Jack's fear of an impending, though uncertain, death, especially when the doctor tells him that the Nyodene could cause a "nebulous mass" to grow within his body (280). After these experiences, Jack decides that because medical science cannot accurately predict when he will die it cannot counteract the chaos in his life: he abandons medical science at this point, realising that it cannot provide him with the psychological security that he requires, and proceeds to question the value of living a life consumed by anxiety and fear (284). Murray suggests to Jack that the fear of death is a universal phenomenon and that only shallow or unintelligent people can avoid it (284). Murray implies that for intelligent, educated people, presumably people like Murray and Jack, there can be no escape from the chaotically determined psychology of death.

Another example of psychological collapse in *White Noise* is the deterioration of Babette after the airborne toxic event. It is ironic that Jack's psychological condition is stabilised to an extent by his determination to understand his wife's fear of death, which he believes to have been caused by her response to the accident, particularly her reaction to his exposure to Nyodene D. Babette's concern for her husband has a far worse effect on her than the effects of Jack's physical exposure. This is an example of the scenario outlined by Baum, whereby the information that people consume about an accident affects them more than the actual physical consequences of that event, and that concern for family and friends exacerbates the psychological perturbation produced by catastrophic events. This is certainly the case with Babette, who is so perturbed by the chaos surrounding Jack that her own psychological state collapses. Jack discovers that Babette is participating in the illegal testing of a new secret, experimental drug designed to alleviate the condition of the fear of death (196). A company called Grey Research has managed to isolate the "fear-of-death part of the brain" and has created a drug called Dylar to treat it (200). Jack becomes desperate to obtain the drug, even though Babette believes that it is ineffective, which leads him to the man who supplied Babette, Willie Mink (299). Mink exhibits severe side-effects from his continual use of Dylar, and this makes Jack realise that the drug cannot cure him of his fear of death. By this point, however, he is already investigating other interpretations of his condition.

From this initial assessment, it is apparent that a literary critique based on the discourse of chaos psychology provides an enriched interpretation of the behaviour of fictional characters like Jack Gladney. In many instances, characters are not faced with

such dramatic events, but with a myriad of trivial events which are confronting nonetheless. A striking example of the effects of chaos can be found in the supermarket Jack and Babette frequent. Jack informs us that:

The supermarket shelves have been rearranged. It happened one day without warning. There is agitation and panic in the aisles, dismay in the faces of the older shoppers. They walk in a fragmented trance, stop and go, clusters of well-dressed figures frozen in the aisles, trying to figure out the pattern, discern the underlying logic, trying to remember where they'd seen the Cream of Wheat. They see no reason for it, find no sense in it (325-6).

The order of the products on the supermarket shelves, once a constant, has bifurcated into a new order that is difficult or impossible for people to understand. The elderly supermarket customers are unable to see the pattern in the rearrangement; for them the supermarket's order has dissolved into disorder. This does not mean, however, that it is lacking in order: it simply means that the customers fail to observe order in the new floor-plan. The rearrangement does not symbolise nonsense but a different kind of sense.

The unknown is often defined as nonsense in the Western intellectual tradition. If something appears to be genuinely unknowable, it is rejected as an absurdity, as a chimera, or trick. In contrast to this form of perception, however chaos theory forwards the hypothesis that systems which appear disordered are complexly ordered, and that what appears nonsensical is not necessarily without value. This philosophy is shared by critics like Elizabeth Sewell, who suggests in *The Field of Nonsense* (1952) that nonsense may be defined as "a collection of words or events which in their arrangement do not fit into some recognized system."⁴³ Nonsense is information without obvious meaning or an obvious context. Alexander Coleman argues after Sewell in "Chaos and Play in Borges" (1977) that "nonsense is produced by a *secret* systemization of materials on the part of the author. The trouble is that we as readers often cannot perceive the system; we don't know the rules of the game."⁴⁴ When considered in the context of chaos theory and information theory, these observations suggest that seemingly nonsensical texts contain information or ideas that are complexly or ambiguously organised and potentially rich in meaning.

⁴³ Elizabeth Sewell, quoted by Alexander Coleman in "Chaos and Play in Borges," *Circulo: Revista de Cultura*, Volume 6, 1977, pp. 27-33, p. 31. See Sewell, *The Field of Nonsense*, London: Chatto and Windus, 1952, p. 3.

Coleman argues that the “delight of reading is in trying to figure out the key to the story,” for “a true understanding of nonsense must be founded on the fact that nonsense is *hidden* sense.”⁴⁵ The aim of literary criticism is to develop the ciphers required to decode the chaotic information represented in open narrative systems. Without these ciphers, the information contained within these narratives will remain inaccessible. This is the case with the reorganisation of the supermarket shelves in *White Noise*; the shoppers don’t know what pattern has been used to reorganise the shelves, and consequently the rearrangement makes no sense to them. From the supermarket’s point of view, however, there was probably a logical rationale for the rearrangement: it may have occurred to utilise floor space more effectively, or to follow a new classification of products. The anxiety caused by the reorganisation of the supermarket is a clear example of Butz’s theory of chaos as anxiety, and it also demonstrates that order and disorder are not absolutes; events are complexly ordered or catastrophically disordered depending on specific points of view.

The supermarket in *White Noise* is an important example of the fictional representation of how chaos effects social systems. Furthermore, it demonstrates a crucial facet of the literary interest in chaos theory - the need to discover the key to the pattern, and the frustration and anxiety that results when this cannot be achieved. The need to ‘figure out the pattern’ is a recurrent theme in DeLillo’s writing, particularly in *White Noise* and in his early novel *Americana*, in which the rising young executive David Bell tries to discover the strange attractor that governs an intriguing office phenomenon:

The door of Quincy’s office was orange and his sofa was dark grey. Some of us in Weede’s group had doors of the same color but sofas of a different color. Some had identical sofas but different doors. Weede himself was the only one who had a red sofa. Weede and Ted Warburton were the only ones with black doors. Warburton’s sofa was dark green and so was Mars Tyler’s door. But Mars Tyler’s sofa was ecru, a shade lighter than Grove Palmer’s door. I had all this down on paper. On slow afternoons I used to study it, trying to find a pattern. I thought there might be a subtle color scheme designed by management and based on a man’s salary, ability, and prospects for advancement or decline. Why did no two people have identical sofas and doors? Why was Ted Warburton allowed to have a black door when the only other black door belonged to Weede Denney? Why was Reeves Chubb the only one with a primrose sofa? Why was Paul Joyner’s perfectly good maroon sofa replaced by a royal blue one? Why was my sofa the same color as Weede’s door? (88-9).

⁴⁴ Coleman, “Chaos and Play,” p. 31.

⁴⁵ *Ibid.*, p. 32.

The problem Bell faces is that that he thinks in a reductionist manner, assuming that there always is an answer, and that it is always possible to find order in complexity. His assumption that a pattern exists within the apparently random office colour scheme cannot be justified: not every message contains a subtle deeper meaning.

Despite the obvious inapplicability of his deductive reasoning, and although he has no rational evidence to justify his suspicion, Bell suggests that a pattern exists in the office furnishings by demonstrating that he is not alone in holding this belief:

There were others who felt as I did. When Paul Joyner walked in to find a new sofa in his office he immediately started a rumor that he was being fired. But this sofa incident had taken place two years prior to the current rumor, the origins of which were never disclosed. He had not been fired; it was not that easy to find the connection. The connection was tenuous but I was sure it was there. At least a dozen times I had taken that piece of paper out of my files and tried to correlate a man's standing with the color of his door and sofa (89).

Bell's interpretation of this nonsensical information is deeply influenced by his anxiety, which develops into paranoia when the office colour scheme information remains indecipherable. Bell insists that there must "be a key. If only I could find it. What I would do when and if I found it was a question that did not disturb me. I would do something. I would change something. I would have protection. I would know the riddle" (89). The desire to understand comes to be an end in itself; solving the riddle becomes a psychological mechanism that offers him "protection" from anxiety. This anxiety and paranoia is discussed by Baudrillard in *Symbolic Exchange and Death*. Baudrillard argues that our rationalist culture "suffers from a collective paranoia. Something or someone must have been responsible for the least accident, the slightest irregularity, the least catastrophe, an earth tremor, a house in ruins, bad weather; everything is an assassination attempt."⁴⁶ This paranoia is the product of a complex society: "the new wave of sabotage, terrorism and banditism is less interesting than the fact that what happens is *interpreted* this way."⁴⁷

White Noise contains similar examples of the need to find order and meaning within complex social systems. Jack believes that the pollutants released during the airborne toxic event are responsible for creating stunning sunsets. Jack and other

⁴⁶ Baudrillard, *Symbolic Exchange and Death*, p. 161.

⁴⁷ *Ibid.*, p. 161.

characters attribute the intense quality of the sunsets to “toxic residue in the atmosphere” (227), and comments that “since the airborne toxic event, the sunsets had become almost unbearably beautiful” (170). Jack notes rumours that “the sunsets around here were not nearly so stunning thirty or forty years ago” (22) and, although he knows that there is no “measurable connection” between the toxic event and the increase in sunset quality (170), he is sure that is the primary causal factor of the sunset phenomenon. What Jack does know, from the school pollution episode and also from his own exposure in the airborne toxic event, is that the causal mechanisms of his environment function in ambiguous, nonlinear ways, and that determining the nature and extent of his exposure to chaos is impossible given his limited knowledge of his environment.

CHAOS AND FARCE

The previous sections explored the discourse of chaos psychology, considered its application to the analysis of accidents and disasters in contemporary novels, and suggested that the interpretation of chaos theory developed in the field of psychology may have significant implications for the analysis of how real and fictional humans think and behave. The discourse of chaos psychology defines accidents as extremely serious events; nonetheless, in contrast to its solemn interpretation of fictional accidents and catastrophes, it is equally reasonable to propose a critique that gives attention to the humorous, satirical, and farcical aspects of catastrophes. Novels like *White Noise* and *Jurassic Park* simultaneously encode the distress and the humour that results from the inability of characters to cope with chaos. The satirical implications of novels that represent chaos theory have thus far not been thoroughly explored. This section will therefore outline a farcical interpretation of the chaotic human condition in Michael Crichton’s *Jurassic Park* and Robert Littell’s *The Visiting Professor*. Before this critique can be initiated, however, a number of factors need to be considered.

Firstly, the nature and function of criticism in the context of deterministic chaos must be taken into account. In *Conjunctions and Disjunctions* Paz argues that the Accident is terrifying, but at the same time he suggests that the “Catastrophe has become

banal and laughable because in the final analysis the Accident is only an accident.”⁴⁸ In his interpretation of Paz’s theory of the Accident in *Symbolic Exchange and Death*, Baudrillard suggests that “the accident, like death, is absurd, that’s all there is to it.”⁴⁹ He responds to the indeterminate ambiguity of the postmodern world by developing a satirical, ironic worldview. He argues in *The Transparency of Evil* that criticism is fundamentally incapable of challenging the prevalence of chaos, and that it can only adopt a “fractal” or ironic disposition. Baudrillard states that the “function of the intellect... [is] to embrace contradictions, to exercise irony, to take the opposite tack, to exploit rifts and reversibility - even to fly in the face of the lawful and the factual.”⁵⁰ He argues that intellectuals fail to offer an effective critique of chaotic conditions if they do not attempt:

to assume this ironic function, confining themselves within the limits of their moral, political or philosophical consciousness despite the fact that the rules have changed, that all irony, all radical criticism now belongs exclusively to the haphazard, the viral, the catastrophic...⁵¹

Criticism is to Baudrillard the examination and acceptance of haphazard and catastrophic social conditions.

Eric Charles White also argues in favour of adopting a farcical response to chaos. Instead of considering the chaotic environment within which criticism functions, however, White examines the structure of novels that represent chaos. In “Contemporary Cosmology and Narrative Theory” (1990) White argues that to represent deterministic chaos, fiction must replace narrative forms like the romantic and the tragic with structures that represent the complex, self-organising behaviour of nonlinear dynamical systems:

Contemporary cosmology... proposes a view of cosmic evolution radically discrepant with tragic, comic, and romantic forms of narrative emplotment. Comedy and romance, both of which look forward to the achievement of lasting perfection, are contradicted by rising entropy that possibly (if not certainly) dooms the universe to a terminal state of frigid stillness and chaos. Similarly, a tragic emplotment predicated on a revelation of the laws

⁴⁸ Paz, *Conjunctions and Disjunctions*, p. 113.

⁴⁹ Baudrillard, *Symbolic Exchange and Death*, p. 161.

⁵⁰ Baudrillard, *The Transparency of Evil*, pp. 39-40.

⁵¹ *Ibid.*, pp. 39-40.

that determine existence seems an unlikely prospect given the sublime incomprehensibility of the universe: Being exceeds Knowledge.⁵²

White suggests that the “most appropriate way to tell the story of nature is, then, a satiric emplotment of cosmic evolution as farce,”⁵³ for this provides:

a form of narrativity consistent with relativity theory (there is no privileged frame of reference), quantum mechanics (‘reality’ is inseparable from specific representational strategies), and chaos theory (the historical unfolding of the universe is unpredictably ‘open’).⁵⁴

The most effective way for literature to represent chaos, therefore, is to define “a satiric emplotment” of chaos as farce.

Secondly, the literary context of farce and satire must be considered. Jessica Milner Davis identifies two specific characteristics of farce in *Farce* (1978) that are relevant to this discussion. Firstly, Davis argues that farcical novels encode an acceptance of the human response to chaos and disorder. Farce embodies “a more tolerant attitude towards man’s stupidity” than other forms of literature,⁵⁵ and generates an indulgent or ironic acceptance of human imperfection.⁵⁶ Romantic and tragic narratives define the damning consequences of human imperfection, whereas farcical narratives allow characters to behave imperfectly without suffering the consequences of chaos. This tolerance of imperfection is evident in DeLillo’s *White Noise*. Jack’s inability to cope with chaos is represented in a savagely comic manner, but because his response to chaos is considered natural or expected, it is defined not as the failure of a specific individual but as an inherent limitation of the human condition. Secondly, Davis considers farce’s “dangerous tendency towards personal satire.”⁵⁷ She argues that the tolerant narration of human imperfection is not maintained in the context of personal satire, and that novels delight in ridiculing the characteristics and beliefs of specific

⁵² Eric Charles White, “Contemporary Cosmology and Narrative Theory,” in *Literature and Science: Theory and Practice*, edited by Stuart Peterfreund, Boston: Northeastern University Press, 1990, 91-112, p. 107.

⁵³ *Ibid.*, p. 107.

⁵⁴ *Ibid.*, p. 107.

⁵⁵ Jessica Milner Davis, *Farce*, London: Methuen, 1978, p. 12.

⁵⁶ *Ibid.*, p. 85.

⁵⁷ *Ibid.*, p. 3.

individuals. Personal satire does not portray people in a flattering or harmlessly amusing light; rather, it focuses on their least impressive characteristics.⁵⁸

Two examples of personal satire will be examined here: firstly, the satirical depiction of chaologists in *Jurassic Park* and *The Visiting Professor*; and, secondly, Sokal's use of satire in "Transgressing the Boundaries" to parody the literary critics who have appropriated chaos theory. To understand how the satirical representations of chaologists in contemporary novels operate, it is necessary to examine the construction of the chaologist in popular chaos theory texts, for the personality traits of fictional chaologists have been deeply influenced by descriptions in Gleick's *New Science* and Waldrop's *Complexity: The Emerging Science*. Gleick defines the typical chaologist as an eccentric male scientist who is a visionary loner. His description of Mitchell Feigenbaum is particularly notable in this regard:

His hair was a ragged mane, sweeping back from his wide brow in the style of busts of German composers. His eyes were sudden and passionate. When he spoke, always rapidly, he tended to drop articles and pronouns in a vaguely middle European way, even though he was a native of Brooklyn.⁵⁹

According to Gleick's account, Feigenbaum possesses an odd appearance and eccentric behaviour: "[e]ven when healthy and at peace, Feigenbaum subsisted exclusively on the reddest possible meat, coffee, and red wine. His friends speculated that he must be getting his vitamins from cigarettes."⁶⁰ Gleick also describes Feigenbaum's highly individualistic ideas: he "was experimenting with twenty-six hour days, which meant that his waking schedule would slowly roll in and out of phase" with the schedules of other people.⁶¹ In another instance, Feigenbaum studies the structures of clouds from aeroplanes until "his scientific travel privileges were officially suspended on grounds of overuse."⁶²

⁵⁸ *Ibid.*, pp. 25-6. Cruel personal satire is evident, for example, in Eco's *The Name of the Rose*. The blind murderous librarian Jorge is often interpreted as a satirical representation of Borges. While *The Name of the Rose* reproduces complimentary allusions to Borges' "The Library of Babel," its characterisation of Jorge is less than purely flattering.

⁵⁹ Gleick, *New Science*, p. 2.

⁶⁰ *Ibid.*, p. 179.

⁶¹ *Ibid.*, p. 1.

⁶² *Ibid.*, p. 2.

Hayles criticises this exaggerated representation in *Chaos Bound*. She disputes the accuracy of Gleick's construction of the chaologist as a "maverick," and adopts a far more critical perspective of the representation of chaologists in popular texts.⁶³ As Patrick Brady points out in "Critical Discussions" (1990), Hayles rejects Gleick's belief that chaos theory was developed by a few men working alone as a postmodern myth designed to elevate the personas and egos of the scientists involved.⁶⁴ Hayles suggests that Gleick's definition of the chaologist is only partially the product of the egocentric excess of scientists like Feigenbaum; his evident admiration of these scientists is a significant factor in their representation. Hayles argues that "most people in the physics community would agree that the style of chaologists is markedly different from the prevailing style in the community - more informal, eccentric, flamboyant." However, she questions whether "this style [is] an outward and visible sign of a different way of thinking," rather than a deliberate ploy to gain attention. Hayles proposes that the excessive personality traits exhibited by chaologists like Feigenbaum have more to do with politics and academic posturing than the spontaneous manifestation of genius.⁶⁵

Hayles' critique of the metafictional representation of chaologists in popular chaos theory texts is reflected in Michael Crichton's satirical representation of the chaos mathematician Ian Malcolm in *Jurassic Park* and *The Lost World*. Malcolm is closely modelled on Gleick's representation of Feigenbaum in *New Science* and on Waldrop's

⁶³ Hayles, *Chaos Bound*, p. 168. For a recent study of scientists' personalities, see Lewis Wolpert and Alison Richards, eds, *Passionate Minds: Conversations with Eminent Scientists*, Oxford: Oxford University Press, 1997. See also "The Nutty Professor," a review of *Passionate Minds* in *New Scientist*, 20 September 1997. www.newscientist.com/ns/970920/review.html (19 Feb 1998).

⁶⁴ Patrick Brady, "Critical Discussions," in *Philosophy and Literature* Volume 14, No. 2, 1990, pp. 367-78, p. 374. This point leads us to Hayles' other criticism of Gleick's chaologist, which concerns the idea that all chaologists are men. Hayles argues that *New Science* marginalises and excludes women from the discourse and construction of the chaos paradigm. The problem with this criticism is whether *New Science* accurately describes the situation in the early stages of chaos theory's development or not. Hayles recognises that "Gleick can scarcely invent [women] where they do not exist," but she does believe that "the exclusion of women in Gleick's text goes beyond the acknowledged scarcity of distinguished women scientists. It pervades the entire depicted world." See *Chaos Bound*, pp. 170-2. A different critique of the cult of the chaologist is offered by Gross and Levitt in *Higher Superstition*; who argue that "there is nothing, on the level of personal idiosyncrasy, that can be said to distinguish specialists in chaos theory from other mathematicians and theoretical physicists. They are not pointedly more heretical in temperament." Gross and Levitt refute the legitimacy of the construction of the chaologist as an eccentric and flamboyant scientist, and argue that the representation of the chaologist as a mad scientist is another (undesirable) aspect of the cultural popularisation of chaos theory. See *Higher Superstition*, p. 94.

⁶⁵ Hayles, *Chaos Bound*, p. 169.

representation of Stuart Kauffman and Chris Langton in *Complexity: The Emerging Science*. Crichton's description of Malcolm is far from flattering: he is a selfish man who possesses a heightened awareness of his own eccentricity. Malcolm is "a tall, thin, balding man of thirty-five, dressed entirely in black: black shirt, black trousers, black socks, black sneakers" (73). His sartorial eccentricity compliments a glib manner and a 'know-it-all' attitude that makes him appear either arrogant or detached. According to another scientist in *Jurassic Park*, scientists like Malcolm possess "a deplorable excess of personality" and often behave like "rock stars" (73). This description corresponds to the eccentric personality traits attributed to Feigenbaum, who is described by Waldrop as earning "a widespread reputation for possessing an oversized ego."⁶⁶

Furthermore, like both Kauffman and Langton, Malcolm suffers a severe physical accident in *Jurassic Park* and spends months recovering.⁶⁷ Langton also spent time working in Puerto Rico, a central location of *Jurassic Park* and *The Lost World*.⁶⁸ It is evident from this brief analysis that Malcolm's character, ideas, and personality are the product of a deliberate personal satirisation of Feigenbaum, Kauffman, and Langton. The association of Malcolm with Kauffman and Langton is reflected in Malcolm's scientific interests: he is fascinated with the fragility of complex biological systems, especially the dinosaurs, and in examining their collapse. This study reflects the work of a group of evolutionary biologists which includes Kauffman and Langton: Malcolm's idea that the dinosaurs evolved towards their own extinction is an adaptation of the concept of "coevolution" developed by Kauffman and John H. Holland.⁶⁹ In *Jurassic Park* Malcolm defines the "Malcolm Effect" (244-5), a parody of the edge of chaos. Crichton satirises the urgency with which chaologists name new hypotheses and concepts after themselves.

Crichton also considers where someone like Malcolm would work. Malcolm is first described in *Jurassic Park* as a "mathematician from Texas" (39), and a little later it

⁶⁶ Waldrop, *Complexity: The Emerging Science*, p. 102. Waldrop also notes that Prigogine is "considered by many other physicists to be an insufferable self-promoter who often exaggerate[s]" his accomplishments, p. 32.

⁶⁷ *Ibid.*, pp. 209-10, 321. In *The Lost World* Malcolm says he was in intensive care for six months (10). The fact that Malcolm died in *Jurassic Park* is conveniently overlooked in *The Lost World*, which was written primarily as a vehicle for a cinematic sequel to Spielberg's film of *Jurassic Park*, in which Malcolm is injured but manages to survive.

⁶⁸ *Ibid.*, p. 206.

⁶⁹ *Ibid.*, p. 259.

is revealed that he is from “UT in Austin” (52). This makes Malcolm’s place of work the real Centre for Nonlinear Dynamics at the University of Texas at Austin, which is the academic home of Ilya Prigogine.⁷⁰ In *The Lost World* we discover that Malcolm has moved on from the University of Texas at Austin to work at the Santa Fe Institute (7). The University of Texas is close to other chaos theory research centres, such as the Centre for Nonlinear Studies at the Los Alamos National Laboratory and the Santa Fe Institute, where Mitchell Feigenbaum and other prominent chaologists work or have worked.⁷¹ Crichton acknowledges that real chaologists have provided essential primary source material in his development of Malcolm. In his “Acknowledgments” in *Jurassic Park* he states that the work of Heinz Pagels “provoked” the characterisation of Ian Malcolm. He also makes reference to the texts of James Gleick and Ivar Ekeland as being influential in his development of chaos theory as a narrative device.⁷² In his “Acknowledgments” for *The Lost World*, Crichton mentions Kauffman and Langton amongst other Santa Fe associates.⁷³

Crichton’s construction of Malcolm can be interpreted as a cruel personal satire of real chaologists. Malcolm’s egocentric nature is representative of literature’s critical perception of the chaos theory phenomenon, particularly the view that there is much more to the paradigm of chaos theory than an emancipatory, anti-establishment worldview. While contemporary literature celebrates the theoretical ideas associated with chaos theory, it is conscious of its political connotations and of the subjective discursive currents that flow through its texts. Hayles’ critique of the subjective underpinnings of the depiction of chaologists in popular texts is sufficient to define literature’s perception of the subjective nature of science’s self-idealisation, but it does not encapsulate this view in an amusing manner. Crichton’s satirical interpretation of Malcolm in *Jurassic*

⁷⁰ The WWW site for The Centre for Nonlinear Dynamics at the University of Texas at Austin is at chaos.ph.utexas.edu/ (10 May 1996). The Ilya Prigogine Center for Studies in Statistical Mechanics and Complex Systems may be found at www.ph.utexas.edu/~smwww/ (10 May 1996).

⁷¹ The Centre for Nonlinear Studies at the Los Alamos National Laboratory in New Mexico may be found at cnls-www.lanl.gov/ (10 May 1996). The Santa Fe Institute is at santafe.edu/ (14 May 1996). The south-west region of the United States contains a geographical concentration of chaos-related research centres. As well as the two University-based Centres listed above, and the Santa Fe Institute, there is also the Santa Cruz Institute of Nonlinear Science at the University of California’s Santa Cruz campus: nonlinear.ucsc.edu/ (15 May 1996).

⁷² Crichton, “Acknowledgments,” *Jurassic Park*, London: Arrow, 1991, p. 401.

⁷³ Crichton, “Acknowledgments,” *The Lost World*, London: Century, 1995, p. 395.

Park and *The Lost World* is different - it challenges the representation of chaologists in popular texts and reveals the fictional stereotypes that contribute to the construction of fictional and non-fictional chaologists. The fictional satirisation of the scientists most involved in chaos theory is a firm indication that even the fictional use of chaos theory has an overtly critical purpose.

An altogether different but equally interesting satirisation of a chaologist is represented in Robert Littell's *The Visiting Professor*, a novel that describes the coming to America of the Russian "theoretical chaoticist" Lemuel Melorovich Falk, formerly of the V. A. Steklov Institute of Mathematics in Leningrad/St. Petersburg. Falk is extremely lucky that, due to the collapse of the Soviet Union, he is finally able to obtain a visa to travel outside Russia to accept a long-standing offer of appointment as a visiting Professor at the "Institute for Advanced Interdisciplinary Chaos-Related Studies" at Backwater University in upstate New York - a parody of the Centre for Nonlinear Dynamics at the University of Texas at Austin and similar centres. *The Visiting Professor* provides a witty portrait of a chaologist who has difficulty explaining chaos theory to a general audience, and whose manner and eccentricities mark him as a typical 'mad scientist.' Like Crichton, Littell has gained a great deal of information about the habits and characteristics of actual chaologists from popular chaos theory texts. The staff of the Institute for Advanced Interdisciplinary Chaos-Related Studies are based on various real chaologists, as the following comparisons illustrate.

The character of Falk is arguably based on Prigogine, at least superficially, for like Prigogine Falk was born in Russia.⁷⁴ Falk survives in threadbare clothing and carries a cardboard valise which identifies him as a citizen of post-Soviet Union Russia. He has a "tangle of ash-dirty hair" (3), and wears clothes so worn and nondescript that after meeting Falk twice, Rain, the young woman who becomes Falk's first American girlfriend, cannot remember what they looked like (44). Despite these humble physical traits, however, Falk has a fierce intellect and sharp personality traits. Further evidence of Falk's origins is provided by Hayles, who explains in *Chaos Bound* that:

One approach to chaos theory is to consider the closely related concept of randomness. In a review article in *Los Alamos Science* (1980), Feigenbaum asks us to consider in what way a number generated by a computer can be random. He points out that a computer-

⁷⁴ Toffler, Foreword to *Order out of Chaos*, p. xi.

based random number generator can easily be constructed by means of a program that does 'nothing more than shift the decimal point in a rational number whose repeating block is suitably long.'⁷⁵

Falk is not so much a chaologist as a 'randomnist,' someone who studies purely random numbers (8). Falk won the Lenin Prize for "his work in the realm of pure randomness and theoretical chaos", and although he considers himself to be "essentially a randomnist who dabble[s] in chaology," it is chaos that he cannot avoid dealing daily with on a personal as well as a professional basis (8-9). He spends much of his time studying chaos rather than randomness, which leaves him in somewhat of a love-hate relationship with chaos.

Falk declares that "What I love is pure randomness. What I fear, what I detest, is chaos, though on a theoretical level, I admit to being fascinated by the possibility of discovering a seed of order at the heart of chaos" (19). The irony of *The Visiting Professor* is that Falk doesn't want to discover chaos, but finds that complex order is everywhere: each time he finds what he thinks is a truly random number it turns out in fact to be a chaotic number; its randomness is only surface deep and beneath that a form of order is always revealed. Falk calls this surface appearance of randomness "fool's randomness," which is "nothing more than the name we gave to our ignorance" (9). His work centres on disproving claims that random events or numbers are really random:

Every time someone put forward a candidate for pure, unadulterated randomness, Lemuel would subject it to the rigorous techniques of chaology, then advance proof that what looked like randomness was in fact determined albeit unpredictable, and therefore not pure randomness at all (9).

Falk coins a term called "Falk's Pale" to define the "grey no man's land where randomness and chaos overlap" (9). This is a parody of "the edge of chaos" and other similar concepts. Falk's Pale is in effect full of fool's randomness.

Falk develops a number of applications for his combination of randomness and chaos theory, including the use of the decimal expansion of pi to create an unbreakable cipher, discovering the solution to a series of murders, and, most important of all, proving that the supermarket is a complexly ordered system. Firstly, while working for the KGB in the Soviet Union, Falk creates a form of complex order: an almost

⁷⁵ Hayles, *Chaos Bound*, p. 152. See Feigenbaum, "Universal Behavior in Nonlinear Systems," in *Los*

impenetrable near-random cipher out of the decimal expansion of pi which is used to code secret messages for the Russian government. Falk does this by programming a computer “to dip almost randomly into the infinite chain of pi decimal places in order to create a three-number key which, in turn, generated ciphers that came remarkably close to being random, and thus for all practical purposes unbreakable” (22). Falk’s ability to manipulate chaos and randomness is a highly valuable commodity, and in *Backwater* he is approached by representatives of various intelligence organisations anxious to hire him. Falk is eventually persuaded to break codes for the Pentagon. Ironically, the messages he deciphers tell the American government that the military and espionage strengths of its enemies are low, a factor that would justify a federal defence budget cut, something the Pentagon obviously doesn’t want to happen (261-2).

Secondly, Falk uses his knowledge of chaos theory to solve a series of murders that occur in *Backwater*, and to understand the intricacies of consumer culture in America, especially to describe the dynamics of the supermarket. Like *White Noise*, *The Visiting Professor* defines chaos as a fundamental property of human environments. Falk solves a series of apparently random murders by insisting that although the killings seem random, the killer must have left clues that establish a pattern of some kind (26-7). Through his research, Falk establishes that one of the unique indicators of a series of purely random numbers or events is the existence of random repetition within them. The police are unable to solve the crimes, but Falk realises that if the crimes are truly random, then they would contain examples of random repetition, just as the truly random decimal expansion of pi contains random order (259).

The only known consistency between the murders is that the victims have been shot with garlic-coated bullets shot at point-blank range from a .38-caliber pistol (160). Falk discovers that there are no random repetitions or coincidences in the serial killings, and deduces from this that the killer is simulating randomness in his activities in an attempt to disguise his real motivation (183-4). Falk hypothesises that if the killer “appeared to select victims randomly, the police would never look past randomness for the motive and the crimes would be impossible to solve.” (184) Falk then proposes that one of the murder victims was an intended victim, and that rest of the victims are

randomly selected to make it appear that the killer has no real motive. Falk solves the crime when he discovers an overlooked detail; one of the victims was a car dealer whose brother-in-law wanted money from him. The brother in law is soon identified as the serial killer (229).

Thirdly, the supermarket in *The Visiting Professor* is represented in a very similar way to the supermarket in *White Noise*. Falk becomes interested in the management of Backwater's E-Z Mart due to his fascination with its multitude of products. The supermarket manager Dwayne quickly discovers that Lemuel has "a natural talent for supermarket management" - Falk realises that the supermarket is a metaphor "for the science of chaos in the sense that order is thought to be lurking behind the appearance of disorder" (139). Dwayne says that while "searching for traces of order amid the chaos of the shelves," Falk informs him of product shortages on the shelves (139). The unanswered question in *White Noise* as to whether the supermarket contain a complex form of order is answered in *The Visiting Professor* by Falk, whose instinctive skill at maintaining and improving the supermarket inventory proves that a pattern of complex order can be found in the chaos and complexity of its shelves.

A significant feature of Littell's novel is its description of the metaphysical nature of deterministic chaos, and the discourse with which it is described. When Falk makes an opening address at an Institute dinner, his speech provides a far from rationalistic scientific analysis of his work. Falk suggests that chaotic complexity explains most of the randomness we perceive in the universe, but he questions whether chaos explains all randomness, which leads him into discussion of his preferred topic, pure unadulterated randomness. Falk states that "deterministic chaos is the explanation for most randomness. But ... is it the explanation for all randomness?" (55). Falk's ultimate endeavour is to demonstrate that pure, unadulterated randomness actually exists: his one success to date has been to prove that the decimal expansion of pi is purely random. This is insufficient for Falk, who wants to show that there are other examples of randomness in the world. He suggests that in delving into pseudo-randomness we have discovered chaos, but beneath that level of chaos lies a deeper and more profound pure randomness which is "the theoretical horizon beyond which there is no other horizon" (55). The

highly speculative nature of this hypothesis is typical of much of the literature, particularly the popular literature, of chaos theory.⁷⁶

Other faculty members at the Institute include its Director, Alfred Goodacre, Charlie Atwater, and Matilda Birtwhistle. The alcoholic Atwater studies the surface tension of water dripping from faucets (5), and is obviously a satirical representation of Robert Shaw, author of *The Dripping Faucet as a Model Chaotic System* (1984).⁷⁷ Gleick notes in *New Science* that Shaw joined the Institute for Advanced Study at Princeton University after his work at the Santa Cruz campus of the University of California, published only two papers in his life, and appeared to be “oscillating” between the scientific mainstream and obscurity.⁷⁸ Littell explores the dripping faucet scenario further through the character of J. Alfred Goodacre, the Director of the Institute at Backwater, who likes to think that his Institute is capable of competing with Princeton’s Institute for Advanced Studies. Given that Shaw worked at Princeton, this is an extremely satirical comment that suggests that Backwater deserves its name. Matilda Birtwhistle cultivates “chaos-related snowflakes in the Institute’s antediluvian laboratory” (6) and is a parody of Norman Packard, who studies snowflakes and who worked at Santa Cruz with Shaw.⁷⁹ According to Gleick, the snowflake is fractally structured, and it is studied in order to gain an understanding of the fractal form of natural phenomena.⁸⁰

The oddest faculty member of the Institute for Advanced Interdisciplinary Chaos-Related Studies is Rebbe Asher Ben Nachman, a Jewish gnostic chaoticist with whom Falk shares a house. Rebbe studies the references to chaos in the Torah; he links chaology’s old meaning, the study of the time before creation, with its new meaning, the study of deterministic chaos. Rebbe argues that God, or Yahweh, “is the incarnation of randomness” (21) and that “Yahweh is high on randomness... Randomness is His *modus*

⁷⁶ Here Littell may be offering up a subtle dig at Stephen Hawking’s *A Brief History of Time*, which has been criticised for moving from one horizon to another to another, leaving most readers perplexed as to where the text and the universe ends. See Stephen Hawking, *A Brief History of Time: From the Big Bang to Black Holes*, London: Bantam, 1988.

⁷⁷ Robert Shaw, *The Dripping Faucet as a Model Chaotic System*, Santa Cruz: Aerial Press, 1984. See Gleick’s description of Shaw’s work in *New Science*, pp. 262-6.

⁷⁸ Gleick, *New Science*, p. 272.

⁷⁹ *Ibid.*, p. 272.

⁸⁰ *Ibid.*, pp. 114, 272, 309-14.

operandi. When he punishes, He punishes randomly” (66). Rebbe believes that God punishes randomly in order to instil fear in people, that it is His unpredictability that induces fear, just as the unpredictability of the accident induces fear and anxiety. At first, Falk does not believe that God behaves randomly, arguing instead that God’s apparent randomness is what he calls fool’s randomness, which in reality is “a footprint of chaos” (68). However, Falk is deeply influenced by Rebbe, and later comes to the conclusion that “Pure, unadulterated randomness... is not the *work* of God. It *is* God” (177).

The character of Rebbe is used to parody the teleological implications attributed to chaos theory by philosophers of religion and to satirise the convergence of scientific and theological discourses. David Ray Griffin discusses the metaphysical possibilities of chaos theory in *The Reenchantment of Science: Postmodern Proposals* (1988). He argues that modern science has taken the mystery and ‘magic’ out of the natural world, and that modern science’s mechanistic, reductionist worldview has disenchanting nature from human consciousness.⁸¹ Griffin suggests that the postmodern appropriation of chaos theory will allow for a ‘reenchantment’ of nature by replacing science’s reductive methodology with one that incorporates an appreciation of mystery and a respect for nature. The reenchantment movement’s discourse combines ideas appropriated from chaos theory with spiritual ideas that are incongruous with the worldview of modern science. Rebbe develops an interpretation of chaos theory which has teleological and even ontological implications. This interpretation is a satirical representation of chaos theory’s appropriation by the reenchantment movement because it draws attention to an explicitly anti-scientific interpretation of science.

Moreover, Rebbe may be considered a satirical manifestation of the originator of the Gaia hypothesis, James E. Lovelock, and Ilya Prigogine, for both scientists have been accused of employing mystical language in their texts. Robert T. Kelley argues in “Chaos out of Order: The Writerly Discourse of Semipopular Scientific Texts” (1993) that Griffin’s discourse has been influenced by Prigogine’s and Stengers’ *Order out of Chaos*.⁸² Briggs and Peat similarly suggest that Prigogine’s concept of spontaneous

⁸¹ Griffin, Introduction to *The Reenchantment of Science*, pp. 2-3.

⁸² Robert T. Kelley, “Chaos out of Order: The Writerly Discourse of Semipopular Scientific Texts,” in *The Literature of Science: Perspectives on Popular Scientific Writing*, edited by Murdo William McRae, Athens: University of Georgia Press, 1993, pp. 132-51, p. 146.

generation - 'self-organisation' - is characteristic of the "reenchantment" philosophy advanced by Griffin.⁸³ Prigogine and Stengers do use animistic language in *Order out of Chaos* to describe the behaviour of complex open systems, but this does not necessarily mean that they endorse a teleological interpretation of chaos theory.⁸⁴ The creative use of scientific language is condemned by the counter-critique for its inaccuracy, but as the case of Lovelock's Gaia hypothesis demonstrates, the style of language adopted by individual scientists does not permanently impede the reception of their ideas.⁸⁵ Prigogine and Stengers do not imply or endorse a teleological interpretation of chaos theory in *Order out of Chaos*, and can be considered no more responsible for Griffin's appropriation of chaos theory than they are for its appropriation by Hayles, Lyotard, and Baudrillard.

In each of these examples, a secret code or form of order exists behind a series of apparently random events. Falk improves the order in the supermarket by modifying the inventory system, he solves a series of murders which had the police baffled, and he creates a cipher that only he can then decipher. Rebbe's ideas are also worthy of close scrutiny. He says at one point that "everything in life is coded," especially including narratives, which "all have a subtext..." (247) and believes that "between the experience [of the world] and the language available to describe it... between *joie de vivre* and its exegesis, there is an abyss. Codes, subtexts are the bridge across the abyss" (247-8). Falk's near impenetrable code represents the complex order hidden of deterministic chaos, and the motif of the code in *The Visiting Professor* functions as a reminder that order exists amid chaos. By the end of the novel, Littell has cleverly woven a number of critical observations about the implications of chaos theory into Falk's applications of chaos theory. Littell's comic use of the dripping tap scenario figures as a recognition that there are few limitations to the applicability of chaos theory to social systems. The incongruity of quantitative studies of physical systems like dripping taps and qualitative

⁸³ Briggs and Peat, *Turbulent Mirror*, p. 151.

⁸⁴ This argument is merely an example of the persistent science wars view that the liberal use of language is a corruption of scientific discourse. See Lewin, *Complexity*, p. 114; and Prigogine and Stengers, *Order out of Chaos*, pp.

⁸⁵ See the discussion of Lovelock's Gaia hypothesis in Chapter Two. Lewin discusses how the Gaia hypothesis was initially dismissed by the scientific community because Lovelock used "poetic" language, which was interpreted as implying that the Gaia hypothesis has teleological implications. Lovelock,

studies of human systems at the Backwater Institute promulgates a satirisation of academia that is reminiscent of *White Noise*.

The fictional satirisation of chaos scientists must also be discussed in relation to a subject that was discussed previously in this thesis: Sokal's parody of literary interpretations of chaos theory in "Transgressing the Boundaries." Science's response to the literary use of chaos theory has been to argue that literature is only interested in science in so far that it can undermine and belittle its achievements, and one of the ways it has achieved this critique has been to satirise the style and techniques used by critics. The literary response has been to maintain that its use of chaos theory is prompted by genuine interest, and that science's critique is tainted by its own subjectivity. It is the emotive quality of this debate has ensured the prominence of parody and satire in the science wars. There is no evidence to suggest that Sokal and others have been personally motivated by fictional critiques such as *Jurassic Park* and *The Visiting Professor*, it is reasonable on a broader level to view science's parodic critique of literary interpretations of chaos theory as a kind of response to the farcical satirisation of chaologists in these novels. The satirical fictionalisation of science has received little attention in the science wars thus far, yet it is this aspect of literature's use of chaos theory that most resembles the attack on science that the counter-critique perceives postmodern literature to embody. This implies that the counter-critique must consider the role of fiction in the literary appropriation of chaos theory in far greater detail.

SUMMARY

This chapter has discussed the developing synthesis of chaos theory and psychology and considered how this may be used by literary criticism to consider new interpretations of the behaviour of fictional characters. This application of chaos psychology supports Baum's hypothesis that the psychological response to disasters far exceeds the extent of their physical severity. In *White Noise* DeLillo confirms that chaotic events provoke anxiety in those who experience them; his characters exhibit many of the behaviours

quoted by Lewin in *Complexity: Life at the Edge of Chaos*, p. 114.

described in the discourse of chaos psychology. DeLillo demonstrates in both *White Noise* and *Americana* that he is adept at creating situations that elucidate chaos and complexity. The interpretations of the school pollution accident, the unpredictability of death, the disorder of the supermarket, and the office colour scheme developed in this chapter all contribute towards the development of a new exploration of chaotically determined social systems.

This chapter demonstrates the applicability of chaos theory to literary criticism in such a manner that even fervent critics of the literary use of chaos theory have come to recognise its legitimacy. Matheson and Kirchhoff acknowledge in “Chaos and Literature” that “if a novel were explicitly and intentionally constructed to demonstrate a parallel between the psychological relations between its characters and the properties of chaotic systems, then chaos theory could help us learn much about the work.”⁸⁶ Literature’s application of chaos theory is therefore justified in at least this one instance. Given the generally negative tone of the counter-critique, this may appear to be a minor recognition of literature’s appropriative tactics. Nevertheless, it is an extremely important acceptance of the applicability of chaos theory to social and fictional systems. The fact that scientists have conceded that chaos theory may be legitimately used by literature is a significant capitulation in the science wars which may have serious consequences for the future of the literary use of chaos theory.

The interpretation of *Jurassic Park*, *White Noise*, and *The Visiting Professor* in relation to chaos psychology and farce provides two distinct impressions of how chaos theory functions in novels. The examination of realistic social events will no doubt remain important; what is significant about this critique is its analysis of the satire in *Jurassic Park*, *The Visiting Professor*, and Sokal’s “Transgressing the Boundaries.” This critique indicates that strategies designed to establish the character of the chaologist within an instantly recognisable social context are at work in both novels and popular texts. Gleick’s *New Science* is a primary source of ideas for *Jurassic Park* and *The Visiting Professor*. The biting personal satire of both novels has been followed by two distinct critical events. The first is the development of the counter-critique, which is arguably a response not only to literature’s critical use of chaos theory but also a retort

to the liberties taken with the personalities of real scientists in these novels. The counter-critique's use of satire could be read as an indication that there are deep connections between it and the fictional representation of chaos theory. Sokal is concerned that the reputation of science will be tarnished if its ideas come to be represented within speculative literary texts, but his texts also exemplify the controlling nature of science's discourse. It is the controlling nature of his discourse that literature is intent on questioning and dismantling.

The second subsequent development to the parodic representation of chaologists like Mitchell Feigenbaum, Stuart Kauffman, and Chris Langton has been a good-humoured acceptance of *Jurassic Park* and other novels on the part of the scientists themselves. The representation of Malcolm as a member of the SFI in *Jurassic Park* has not gone unnoticed by the SFI: its webpages now include 'Professor Ian Malcolm' as a member of faculty, complete with his own email address, and a list of satirically titled research papers including "Simulations Predict Hermeneutics in Plectics is P-complete" and "Black Noise and Changing Consciousness and the Limits of Knowledge."⁸⁷ The SFI's appropriation of Malcolm defines a distinctly different recognition of the literary use of chaos theory than that represented by the counter-critique; it is further evidence that not all scientists are opposed to literary uses of science, and represents a symbolic capitulation in the science wars. This chapter has revealed two instances wherein science has acknowledged the legitimacy of the literary interpretation of chaos theory, and has confirmed that the chaotic psychological dynamics of contemporary novels constitutes an extremely fertile area of enquiry. More detailed analysis may well uncover further instances of this acceptance, and may encourage a more detailed examination of chaos psychology and fiction than has been possible here.

⁸⁶ Matheson and Kirchoff, "Chaos and Literature," p. 42.

⁸⁷ SFI Malcolm page is at www.santafe.edu/~malcolm/ (21 Aug 1997). Malcolm's e-mail address is malcolm@santafe.edu. See the SFI publications page at www.santafe.edu/~malcolm/publications/ (25 Sept 1997). Some of the papers have been co-authored by the fictional SFI faculty members P. Crutchkin and D. Mitchfield, who are thinly-disguised representations of the SFI chaologists James Crutchfield and Melanie Mitchell.