

STRANGE TIME: BLOCK UNIVERSES AND STRANGE LOOP PHENOMENA IN
TWO NOVELS BY KURT VONNEGUT

by

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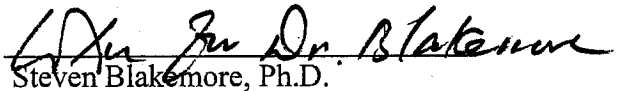
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This thesis was prepared under the direction of the candidate's thesis advisor, Dr. Thomas Martin, Department of English, and has been approved by the members of his supervisory committee. It was submitted to the faculty of the Dorothy F. Schmidt College of Arts and Letters and was accepted in partial fulfillment of the requirements for the degree of Master of Arts.

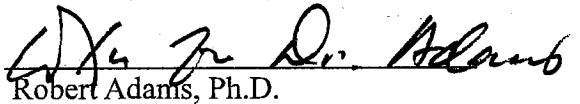
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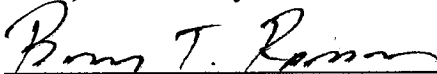
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ABSTRACT

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Einsteinian relativity forever altered our understanding of the metaphysics of time. This study considers how this scientific theory affects the formulation of time in postmodern narratives as a necessary step toward understanding the relationship between empirical science and literary art. Two novels by Kurt Vonnegut, *The Sirens of Titan* and *Slaughterhouse-Five*, exemplify this synthesis. Close readings of these texts reveal an underlying temporal scheme deeply informed by relativity. Furthermore, this study explores how relativity manifests in these texts in light of the block universe concept, Gödelian universes, and strange loop phenomena. Vonnegut's treatment of free will is also discussed. All of these considerations emphasize Vonnegut's role as a member of the Third Culture, an author who consciously bridges C.P. Snow's two cultures.

DEDICATION

This manuscript is dedicated to my late grandfather, Alex Coveleski, whose memory will remain forever preserved like a bug in amber. Also, to Ruth Coveleski, Dr. Frank Altomare, and Millie Altomare, who have always nurtured my aspirations as a scholar. Lastly, to my brothers, Jordan Altomare and Johnny “Bug” Amado, and to my courageous ma.

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CHAPTER ONE

“SWEETLY INTERTWINE”: VONNEGUT AND THE THIRD CULTURE

The alleged rift existing between the sciences and literature was first widely exposed by C.P. Snow in *The Two Cultures and the Scientific Revolution*.ⁱ In that text, Snow boldly declares:

I believe the intellectual life of the whole of western society is increasingly being split into two polar groups . . . at one pole we have the literary intellectuals . . . at the other scientists, and as the most representative, the physical scientists. Between the two a gulf of mutual incomprehension . . . (4)

Recent debacles such as the Science Wars¹ have further drawn attention to the apparent gap in awareness between the humanities, including the literary community, and its scientific counterparts. However, proponents of this species of dualism, overly fond of binary dialectics, have inflated the extent of the divide between these two ostensibly irreconcilable academic cultures. Rather than forming two diametrically opposed cultures as Snow describes, literature and the sciences in the postmodernⁱⁱ period inform and enrich each other. Aware of the dangers of this and all binaries, Snow warns that

“[a]ttempts to divide anything into two ought to be regarded with much suspicion” (10).

i This work itself is derived from the Rede Lectures of 1959

ii Here and throughout this thesis, postmodern refers to the literary period after World War II and must not be confused with postmodernism as a theoretical system.

Particularly in the twentieth century, literature often embraced scientific discovery as a reservoir of both metaphysical questions and possible answers to those questions. The intersection of disciplines has led some scholars to posit the emergence of a Third Culture.² Snow himself inhabits this particular sphere and coins the term “third culture” in his subsequent essay, “The Two Cultures: A Second Look.” Those writers constituting the Third Culture suffer from a common dilemma, notably the problem of reconciling literature and science as equally valid epistemologies. Thankfully, such a culture produces hybrid intellectuals, authors willing to immerse themselves in discourses on both sides of the divide.

Often, the genre of science fiction assumes the responsibility of engaging scientific themes and wrestling with the philosophical ramifications of a scientific worldview.ⁱⁱⁱ Yet, several authors once considered part of this genre have moved into the domain of literature. Among the most notable of these authors is Kurt Vonnegut. As Boon notes, “Vonnegut is a storyteller in the scientific age—a post-Nietzschean, post-Einsteinian sage writing in a time of long-dead Gods and inhumane science” (qtd. in Morse *Imagining* xvi). Biographical commentators repeatedly emphasize his background in physical science and his graduate work in anthropology.³ Other scholars note the influence of his years as a technical writer for General Electric, a position Vonnegut himself frequently discusses in his nonfiction.⁴ Snow's comment on his own dilemma is informative when discussing Vonnegut: “[b]y training I was a scientist: by vocation I was a writer,” Snow declares (1). Vonnegut exemplifies this same situation. Several of Vonnegut's novels, notably *Cat's Cradle* and *Player Piano*, place science at

iii See Sheila Schwartz's “Science Fiction: Bridge Between the Two Cultures.”

their thematic epicenters, engaging the moral issues at play when technology seems counterpoised against humanity.

Ever the skeptic, Vonnegut never feels quite comfortable with an unquestioning acceptance of science as dogma. Likewise, he never quite adjusts to being labeled a science fiction writer.⁵ As he comments in his nonfictional collection *Wampeters, Foma, and Granfaloons (WFG)*, after the publication of his first novel, he “learned from the reviewers that [he] was a science-fiction writer” and admits he “would like out” (1). Nevertheless, the fact remains that Vonnegut's fiction espouses scientific ideas and investigates the philosophical implications of these ideas. Unlike fantasy, science fiction achieves its suspension of disbelief via “credible science” (Wood and Wood 137). Regardless of the debate over genre, as an author Vonnegut exemplifies this Third Culture in his capacity to discuss scientific ideas through the medium of literature.

In this capacity, Vonnegut is something of a paradox. Frequently, he espouses scientific ideas, as he does with evolution by natural selection in *Galapagos*. Just as often, his satirical voice targets science, as he does most notably in *Cat's Cradle*. In many ways, Vonnegut's skepticism^{iv} answers the critical challenge proposed by philosopher of science Karl Popper. Popper states:

Thus science must begin with myths, and with the criticisms of myths; neither with the collection of observations, nor with the invention of experiments, but with the critical discussion of myths, and of magical techniques and practices. The scientific tradition is distinguished from the pre-scientific tradition in having two layers.

iv Vonnegut's persistent skepticism makes him something a disciple of that ultimate skeptic, David Hume.

Like the latter, it passes on its theories; but it also passes on a critical attitude toward them. The theories are passed on, not as dogmas, but rather with the challenge to discuss them and improve upon them (66-67)

Throughout his oeuvre, Vonnegut follows Popper's project, and through his fiction he is able to breach the divide between science and literature, coming to a richer understanding of both.

He confesses his awareness of the need to reconcile the two cultures in his nonfiction. There he claims that science fiction writers “are among the precious few Americans in whose minds C.P. Snow's two cultures sweetly intertwine” (*WFG* 4), intimating that he sympathizes with their endeavour despite his reluctance to join their “lodge.” Incidentally, he too is one of those “precious few,” and the themes which he addresses often rest at the center of contemporary scientific debate. As Lundquist perceptibly comments, “Vonnegut's method accords well with the major changes in the conception of physical reality that have come out of contemporary science” (72-73). In addition, Vonnegut commandeers techniques common to science fiction to express deeper epistemological concerns. As Jerome Klinkowitz notes, “science fiction can help reinvent reality, which is itself just an arbitrary convention” (*Kurt Vonnegut* 60). The designation of reality as “arbitrary convention” might disturb the hardline objective realist, but Klinkowitz's comment is directed more toward subjective reality than the physical universe. Through his fiction, Vonnegut certainly attempts to reinvent and understand subjective reality, but always with a firm stance in the theories of

contemporary science.

Specifically, a significant quantity of Vonnegut's work addresses the phenomenon of time, one of the prime areas of investigation in fields as diverse as philosophy, narratology, theoretical physics, and cognitive psychology. As empirical science clarifies our understanding of the metaphysics of time, we must acknowledge the effects of these empirical discoveries on contemporary narratives. Many scholars have noted the nonlinear structures prevalent in postmodern novels.⁶ Several Vonnegut critics have tangentially noted the effect of Einsteinian relativity on his novels.⁷ Yet, such criticism tends to veer away from the scientific aspects underlying Vonnegut's time scheme and prefers to comment on his fatalism or moral intentions. Unfortunately, many Vonnegut critics "seem to gravitate instinctually to those stories with no whiff of science" (Karon 106).⁸ Because science as a theme permeates Vonnegut's oeuvre, understanding his relationship to (and conflicts with) science is crucial for gaining an understanding of his work. No one has yet thoroughly established the central role that relativity plays in Vonnegut's oeuvre nor fully detailed the complexity of Vonnegut's temporal vision.

Vonnegut's works exist as a complex, self-referential network, and thus they must be considered together if we are to appreciate the intricacies of his experiments with time. Two novels in particular form the basis of Vonnegut's temporal considerations. The first is his second novel, *The Sirens of Titan (ST)*.⁹ In this text, Vonnegut formulates the fundamentals of his time schema that he will fully develop in his masterpiece, *Slaughterhouse-Five (SHF)*. Read together, these two novels posit a relativistic, simultaneous universe. In a simultaneous universe such as the one that Einstein

describes, space is curved, and objects can hypothetically leave from one point only to return to that very point of departure.^v Such a universe exhibits the qualities of the phenomenon termed a strange loop by Hofstadter. In other words, when moving through time and space in this type of universe, one might walk through a back door only to re-enter through the same door, given certain hypothetical parameters such as exceeding the speed of light.

In his seminal study *Gödel, Escher, Bach: An Eternal Golden Braid (GEB)*, Hofstadter defines a strange loop, also termed a tangled hierarchy, as a “phenomenon [that] occurs whenever, by moving upwards (or downwards) through the levels of some hierarchical system, we unexpectedly find ourselves right back where we started” (10). As Hofstadter exhaustively demonstrates, strange loops manifest in music, mathematics, visual arts, and various other media but, save a few examples, they have rarely been discussed regarding literature. Besides some recent work on time-travel narratives, there has been little investigation into this possibility.¹⁰ As much of Vonnegut’s work, both in content and form, corresponds to the criteria of a strange loop, it is highly likely that his texts function as examples of this phenomenon. In Chapter Three, I intend to demonstrate that the aforementioned novels of Vonnegut are indeed strange loops, both in content and form, and therefore illustrate a view of time that is markedly different from relativity proper, though the two provisions are not mutually exclusive.

Like their modernist predecessors, many postmodern authors employ nonlinear narratives which reflect the chaotic reality they seek to portray.¹¹ However, scientific advances elucidating the nature of time, particularly in the discipline of theoretical

v This latter effect is a result of Gödel's corollary to Einsteinian relativity, discussed in Chapter Three.

physics, markedly divorces the postmodern writers from their predecessors. In particular, the non-linearity of time proposed by Einstein, and later elaborated by Hawking and others, manifests itself in many postmodern works. Moreover, the nonlinear geometry of relativity complements the quantum mechanics developed by Heisenberg and Bohr.¹² These theories, and their philosophical implications, underlie the way postmodern authors understand and portray time.

Time forms one of the primary devices by which an author can manipulate his plot, if only because plot and time are so inextricably bound. Nevertheless, despite Aristotle's once-hallowed tenets of linear, absolute time and his literary theory, expounded in his *Physics* and *Poetics* respectively, postmodern novels began rebelling against this construction of the universe and "dramatizing this chronological confusion" (Burgess 177). The implications are far-reaching. If a narrative is nonlinear then the plot should, by Aristotelian definition, cease to function. This is not the case as evidenced by the work of Kurt Vonnegut and others.¹³ Rather, manipulating the linearity of time seems to enrich the text, making it even more effective than linear sequential narratives. Ricoeur himself denied the reality of an absolute, universal history, proposing a series of subjective narratives.¹⁴ Deleuze and Guattari took the argument further when they proposed that narratives, and indeed the time they manifest, are actually a series of complex rhizomes breaking down into self-referential systems.¹⁵ Significantly, the postmodern concept of time defies the declarations of both Hegel and Marx, who posit an objective time, a universal history. Thus, time in the postmodern novel, and especially in those of Vonnegut, becomes more akin to Hofstadter's strange loop. Time functions in

these narratives as a self-referential system, folding into itself and making inexplicable departures and returns, its discrete moments deeply entangled like a Gordian knot.

Significantly, Vonnegut's literary universe rejects any notion of scientific absolute time, a Newtonian assumption that persisted until Einstein's relativistic revolution of the early twentieth century. Vonnegut and his critics often refer to the author's debt to Guy Murchie's popular cosmological study *Music of the Spheres*. That work addresses a wide range of contemporary scientific theories, especially relativity. Like Vonnegut, Murchie addresses the philosophical history of relativity, noting that "[o]ther thinkers echoed the relativity concept, from Leibniz's concession that 'there is no real motion' through Huygens, Berkeley and Kant to Maxwell's balanced summary that all our knowledge, both of time and space, is essentially relative" (523). This statement, among others, aligns Vonnegut with Murchie. More significantly, both authors had general audiences in mind in their treatments of relativity. However, critics have attributed too much of Vonnegut's science to Murchie's influence. Although the authors seek similar audiences, Murchie's book was published rather late, indeed after *The Sirens of Titan* and not much earlier than *Slaughterhouse-Five*. Therefore, the Vonnegut's debt to Murchie might be largely an *a posteriori* development.

While Murchie's work provides an accessible exploration of the themes Vonnegut also engages, Vonnegut's temporal schema finds its basis in the science itself. Therefore, Vonnegut aligns himself strikingly with Einsteinian theory proper. Consequently, time in Vonnegut's texts becomes nonlinear and dynamic rather than absolute and directional. Instead of simply using time travel tropes as plot devices, Vonnegut seems to make

grander metaphysical suggestions in his unorthodox treatment of the space-time continuum. As Lundquist states, Vonnegut “is deeply interested in epistemological questions of an impressive variety – the unreality of time, the problem of free will, the nature of a pluralistic universe, and man's ability to live with his own illusions” (16). These epistemological and indeed metaphysical concerns fold themselves back into the texture of his narratives. While those narratives may seem fractured, they are certainly not chaotic, pointing to an underlying order and even a certain determinism.

This observation of a simultaneous, recursive universe in the texts raises several points long debated by Vonnegut critics: Vonnegut’s presentation of time might suggest a type of fatalism; Vonnegut seemingly embraces a view of time and memory similar to that proposed by Henri Bergson; but simultaneity in Vonnegut’s time-travel novels denies the existence of free will. Determinism becomes a central point in arguments against accepting Vonnegut’s portrayal of simultaneous, recursive time. According to the Vonnegutian construal of time, as voiced by characters like Winston Niles Rumfoord in *The Sirens of Titan*, events occur as they must. Vonnegut expands this perspective through the Tralfamadorians in both novels, and they become symbols of nonlinear time. The effect of Tralfamadorian nonlinear time is essential: when the actions of time traveling affect the inevitable actions of the future dependent on the past, we have ourselves a clear example of a strange loop. This, in turn, implies the possibility that Vonnegutian time is deterministic or, more probably, fatalistic. Clarifying the place of free will in Vonnegut’s fictional universe requires an investigation of the work of Henri Bergson, who himself tackled the implications of Einstein's proposals. In light of

Vonnegut's relationship with Bergson, we can understand the philosophical ramifications of Vonnegut's treatment of time.

In the post-Einsteinian era in which Vonnegut writes, time cannot be linear. The consequences for fiction are extreme. Writers similar to Vonnegut, like Borges, often adopt nonlinear approaches to time, which indeed coincide with the conclusion of Einstein himself: the universe exists as a simultaneity. Rather than a universe progressing along an arrow of time, it is human attention that exists in a linear, Aristotelian fashion. Memory, per Bergson's definition, allows the subjective mind to perceive events in the universe simultaneously.

The issue of simultaneity and strange loops raises some theoretical concerns. First, must the events in a strange loop be sequential for the loop to function or can they be erratic, as in the case of Billy Pilgrim's jaunts in *Slaughterhouse-Five*? If one compares Vonnegut's narratives to certain representative works by Escher, it would seem that order does not matter since the entire loop manifests simultaneously. Second, we must consider how Vonnegut's fictional universe approximates a Gödelian universe. Gödel's mathematics, most notably the Incompleteness Theorem discussed by Hofstadter, purport strange loops in the ubiquitous number theory underlying the mechanics of the universe itself, including absolute Newtonian time. Gödel's model of the universe, propounded in his corollary to Einsteinian special relativity, likely corresponds to Vonnegut's idea of time. Both of these issues will be discussed in Chapter Three.

Some have suggested that Vonnegut's departures from absolute, Newtonian time are merely the antics of a playful iconoclast repudiating another presumed certainty in

the face of the ironies of human existence. While perhaps initially Vonnegut's "cosmic joke" adopts a Carrollian viewpoint, the novels reflect likely physical possibilities when examined in light of contemporary physics. Rather than an Alice Universe, a term ascribed by physicists to realms with different physical laws than our own, the universes of *The Sirens of Titan* and *Slaughterhouse-Five* manifest a possible post-Einsteinian reality. One consequence is that the seemingly erratic events approach each other spatially. Stylistically, Vonnegut maintains the technique throughout his subsequent novels and it certainly suggests his adherence to nonlinear, relativistic time.

The concept of time adopted by Vonnegut incorporates a wide array of philosophical and scientific viewpoints. Indeed, his method is something of a strangification or *Verfremdung*.¹⁶ As defined by Friedrich Wallner, strangification is a central concept of constructive realism that seeks "to transfer a certain system of (scientific) sentences from one context (of scientific theories, paradigms, etc.) into another system of sentences" (qtd. in Löfgren 50). Since this is precisely what Vonnegut achieves, I will frequently refer to time as construed in these two novels as *strange time*. This conception of time is threefold. First, it subscribes to the tenets of both the special and general theories of relativity. Second, it implies the existence or possibility of a block universe. Lockwood defines a block universe as regarding "everything that ever exists, or ever happens, at any time or place, as being just as real as the contents of the here and now . . . at all times and places, actuality through and through" (69). In other words, a block universe is one where all events have already occurred and are distributed throughout the space-time manifold. Third, strange time exists as a recursive strange

loop. The multidisciplinary synthesis of ideas required to describe strange time situates Vonnegut in the liminal space of the Third Culture, moving between ways of knowing in the sciences and humanities and drawing them together in a more sophisticated mode of understanding. Here, a confluence of ideas from the humanities and sciences converge into a luminous whole that attempts to describe the phenomenal world. Vonnegut's project in these two novels undertakes a similar approach. As I discuss the ramifications of strange time in Vonnegut's novels, I will bear this synthesis in mind and consider the broader effects of such literary approaches.

CHAPTER TWO

“BUGS IN AMBER”: VONNEGUT AND BLOCK UNIVERSES

More than any other idea of the twentieth century, Einsteinian relativity revolutionized the metaphysics of time. Both the special and general theories reconfigured how physicists and philosophers envision the universe. In the wake of these theories, neither space nor time were any longer absolute. The tenets of Newtonian mechanics, upheld for centuries, toppled to the ground in one fell swoop. Einsteinian relativity completely renovated notions of space, motion, and most significantly, time. Of course, ideas of this magnitude do not long remain isolated within one discipline; relativity was no different. As the Space Age dawned, Einsteinian relativity soon diffused from physics laboratories to the popular imagination. Inevitably, relativity manifested in fictional narratives attempting to come to grips with a scientific theory that seemingly defied conventional logic and with the great mysteries of the stars. As Vonnegut states, “Mankind flung its advance agents ever outward, ever outward. Eventually it flung them out into space, into the colorless, tasteless, weightless sea of outwardness without end” (*ST 1*). It was the socio-cultural climate surrounding manned space flight that truly brought relativity into the forefront of popular discourse.

Vonnegut himself acknowledges his struggle with relativity in his nonfictional work *Wampeters, Foma, and Granfaloons*. Commenting on Sagan and Shklovskii's

Universe, Life, Mind, Vonnegut states: “[the authors] patiently explain to me what I am too dumb to understand ever: why hearts and clocks naturally slow down as they approach the speed of light . . . I believe this, and much, much more because I guess it is my duty to” (23). Certainly Vonnegut wrestles with the vast implications of relativity in his fiction, but he admittedly accepts it as fact with an almost religious submission. In some sense, he accepts relativity on faith rather than on reason. This leads to a crucial aspect of both novels: Vonnegut's experimentation with both the metaphysical and moral ramifications of relativity. The former is the domain of Einstein, whom we shall discuss in this chapter; the latter, of Henri Bergson, whom I shall treat in detail in the final chapter. Yet, it is Einstein who forms the basis of Vonnegut's project, and an understanding of relativity is crucial to understanding both novels. As Lundquist notes, *Slaughterhouse-Five* “functions to reveal new viewpoints in somewhat the same way that the theory of relativity broke through the concepts of absolute space and time” (71), drawing attention to Vonnegut's debt to Einstein.

Special relativity states that the speed of light is the same for all observers, but anomalies in temporal perception occur due to differences in reference frames. The theory adopted Minkowskian space-time as a means of explaining the effects of such principles. Einstein, Putnam, and others likewise argue that the “correct way to interpret special relativity is to view it as describing a four-dimensional space-time manifold” (Lockwood 57). Bertrand Russell claims that “space-time . . . is, from a philosophical and imaginative point of view, perhaps the most important of all the novelties that Einstein introduced” (37). This leads to some interesting consequences that I will discuss

shortly.

General relativity states that space is curved by mass. But, more importantly, gravity has a peculiar effect on time. Time itself appears to run slower near massive bodies.¹⁷ The effects of time dilation led Stephen Hawking to state that “the theory of relativity put an end to the idea of absolute time” (21), reinforcing the notion that in Vonnegut's texts, we as readers are moving away from Newton's everyday mechanics. The Einsteinian perspective adopted by Vonnegut breaks him from a long tradition of writers and thinkers who proclaimed that time was absolute and linear. Neither the physicist nor the novelist can seriously espouse the linear time of Newton because “Einstein tells us that Copernicus and Galileo were, after all, not any righter than Ptolemy and the Pope” (Hofstadter *Metamagical* 108). With these considerations in mind, we can understand the extent of the similarities between Einstein's theories and Vonnegut's fictions, both of which suggest that time is both nonlinear and simultaneous.

Within the two primary novels dealt with here, we find two similar hypothetical scenarios. First, Vonnegut introduces the *chrono-synclastic infundibulum* in *The Sirens of Titan* as an astronomical anomaly through which anything that passes becomes spread across both space and time, existing as a “wave phenomenon.” The aristocratic Winston Niles Rumfoord “run[s] his private space ship right into the heart of an uncharted chrono-synclastic infundibulum two days out of Mars” (7), and throughout the narrative he serves as the mouthpiece for this relativistic perspective. He often unsuccessfully explains this viewpoint to Malachi Constant, the millionaire playboy whose metamorphoses constitute the primary action of the novel, and Beatrice Rumfoord,¹⁸

Winston's estranged wife who eventually becomes Malachi's mate on Titan. While not subjected to the effects of the infundibulum directly, these two characters serve as contrasts to Rumfoord's relativistic omnipresence.

Vonnegut explains the infundibulum through a work within the work, *Dr. Cyril Hall's A Child's Cyclopedia of Wonders and Things to Do*. The satire here is likely a play on the parsimony of Einstein's idea, which forms the basis for the concept of the infundibulum. Vonnegut jokes that the simplicity of relativity, at least in concept a paragon of Ockham's Razor, resembles the fantastic stories proffered to children; and his fictional source indicates that truth itself, in light of relativity, is no longer absolute. As the fictional text explains, chrono-synclastic infundibula are places “*where all the different kinds of truth fit together as nicely as the parts in your Daddy's solar watch*” (9, italics his). Indeed, “[t]he infundibulum is a sort of gyre in time and space, within which all truths become known” (Reed 62), and it serves as a tool for investigating the philosophical dilemmas raised by relativity. As a result of passing through the infundibulum, Rumfoord and his dog “*are scattered far and wide, not just through space, but through time, too*” (9).

The situation of the infundibulated Rumfoord accords with possible consequences of a relativistic universe. Rumfoord and his dog Kazak are spread through Minkowskian spacetime, existing simultaneously at various time coordinates and “spread all the way from the sun to Betelgeuse” (181). In light of the Hawking-Penrose singularity theorem derived from Einstein's theory and subsequent postulates on black holes, Rumfoord's condition becomes a literary manifestation of a physical possibility. If information

(including matter and even consciousness as an emergent property of organic material systems) is spread across the event horizon, then the observer would witness a vast passage of time but appear unchanged or “frozen” to the external spectator. Throughout the novel, Rumfoord seems to manifest such possibilities. Furthermore, Rumfoord's perspective suggests a sort of metaphysical eternalism, the idea that “past and future objects are ontologically on a par with present objects” and “[e]xisting things are spread out in both space and time” (“Death”). Metaphysical eternalism is concomitant with Einsteinian relativity.

In *Slaughterhouse-Five*, the hypothetical situation of Billy Pilgrim, the time-traveling veteran of the bombing of Dresden, serves a purpose similar to the chronosynclastic infundibulum in *The Sirens of Titan*. Billy Pilgrim becomes “unstuck in time” (23), experiencing erratic jaunts across moments in his lifetime. Through this experience, he arrives at an understanding of time remarkably similar to Rumfoord's. Like Rumfoord, Billy experiences moments throughout his life sporadically, defying traditional linear concepts of localized space and time. At some instances, he is on the planet Tralfamadore; on others he is experiencing the horrors of World War II and the bombing of Dresden. In fact, as the narrator explains, “[a]s a time-traveler, [Billy Pilgrim] has seen his own death many times, has described it to a tape recorder” (141). Like Rumfoord, Billy understands time as nonlinear and relative. Like Rumfoord, he is not confined to a single continuum. But this does not prevent him from attempting to describe his dilemma in linear text. According to Ricouer, “[t]ime becomes human time to the extent that it is organized after the manner of a narrative; narrative, in turn, is

meaningful to the extent that it portrays the features of temporal experience” (*Time and Narrative* 3). In the case of Billy Pilgrim, that narrative assumes a nonlinear quality that reflects the nonlinear quality of his own temporal experience.

As the narrator states early in the text, “[Billy] has seen his birth and death many times, he says, and pays random visits to all the events in between. He says.” (*SHF* 23). Here the narrator raises some doubts about Billy's metaphysical condition from the outset. While this ambivalent voice reflects the skepticism of Vonnegut's narrator, this has led some critics to equate Billy's atemporality with schizophrenia or some comparable psychological condition. However, the narrator's doubt reflects the reader's doubt and allows the reader to be a skeptic from the outset. Skepticism is fundamentally part of science as both Hume and Spinoza construe it. Likewise, Popper often argues that science finds its strength on its ability to disprove through doubt rather than construct truths. The narrator in Vonnegut's novels echoes this skepticism.

Briefly, we must dismiss the possibility that Billy Pilgrim's jaunts through time are hallucinatory in nature. Broer and others have suggested that the time-travel of Pilgrim reflects his unstable mental condition and worsening schizophrenia.¹⁹ Somer likewise states that “Billy . . . does not possess a pure vision of reality but an approximation of it, an illusion that conforms so closely to the fourth dimension that Billy experiences a beatific vision, an illusion created by the dynamic tension between his two worlds” (245).²⁰ However, if we are to take the implications of this satire seriously, we must assume for the purposes of the fiction that Billy truly does experience these jaunts through time. As Morse notes, readers who believe Billy is hallucinating

“deny the fantastic premise of Vonnegut's novel that Billy Pilgrim does come unstuck, that he does indeed move forward and backward in time” (89). If it is all fantasy, it loses much of its significance. To say it is fantasy is, one, to misread the genre and, two, to neglect all the science Vonnegut adopts within the story. Vonnegut constructs Billy's narrative around the solid foundations of Einsteinian relativity largely to lend them the validity of “credible science” (Wood and Wood 137). Just because Tralfamadorian time does not correspond to our immediate linear perception of time does not relegate it to schizophrenic delusion. Contrasting Harris's assertion that absurdist novels negate realism in the novel, Lundquist argues that “Vonnegut has come up with a representation of Billy Pilgrim's universe that is in itself a new concept of realism – or reality” (74). That reality is a markedly post-Einsteinian one.

Lastly, it is the inhabitants of the alien world Tralfamadore, mentioned in both novels (albeit with slightly differing details), who truly manifest strange time and explain its nuances. As Billy's guide states in *Slaughterhouse-Five*, “I am a Tralfamadorian, seeing all time as you might see a stretch of the Rocky Mountains” (85). All events, past, present, or future, coexist according to this schema. Like God in the works of Boethius and Aquinas,²¹ the Tralfamadorians perceive all time in the universe simultaneously. As I discussed earlier, physicists term such a universe a block universe, and it is likely that Vonnegut's Tralfamadorian perspective describes such a scenario. Furthermore, it is likely that the Tralfamadorian view of time approximates that of Einstein's favorite philosopher, Spinoza, who claimed to see the world *sub specie aeternitatis*^{vi} and tenseless.²² To the Tralfamadorians and Spinoza, “Eternity is present in the things / of

vi Lit. “from the perspective of eternity”

time and its impatient happenings” (Borges *Poems* 245). The god-like omniscience of the Tralfamadorians certainly approximates Spinoza's view, and Einstein himself adopted this same perspective.

As a result of their respective temporal perspectives, Pilgrim, Rumfoord, and the Tralfamadorians defy what we might call the common human experience of time, Newtonian time, or even existential time, as in Heideggerian “within-time-ness” and his standard notion of *Dasein*.^{vii} This not only sets Vonnegut at odds with traditional science and narrative, insofar as time is concerned, but also at odds with modernist existential writers. His project, different from all these other writers, at a very minimum, raises metaphysical questions about the duality of space and time. Neither Pilgrim, Rumfoord, nor the Tralfamadorians exist at specific times or places. Rather, they exist as multiplicities, not as discrete bodies. More importantly, they exist outside traditional linear time. Largely, they represent characters that embody a relativistic perspective of time, as well as Vonnegut's struggle to reconcile relativity with human nature. Humans often configure their lives through linear, or semi-linear, narratives. In one sense, linearity lends these narratives a sense of cohesion. In another, it accords with the psychological perception of time as a unity.

As Stanley Schatt rightly observes, “Vonnegut ridicules the Aristotelian concern with the unity of time and the New Critical concern with the tightly plotted novel . . .” (Schatt 98). For Aristotle, unity of action constitutes an essential element of plot. Likewise, time for Aristotle is a distinctly linear continuum. However, Vonnegut's novels reject this view in favor of Einsteinian nonlinearity. Events in both novels are introduced

vii Traditionally translated as “being there”

simultaneously. This rejection of linear structure is most evident in *Slaughterhouse-Five*, where there is no temporal beginning, middle, or end. Rather than Heraclitus's *panta rei*, the text posits a static, unchanging universe. This counterpoises Vonnegut's text against Aristotle and his successors.

As in Aristotle's work, linear time becomes a crucial part of Augustine's metaphysics in both his *Confessions* and *The City of God*. While Aristotle's remarks on time are important, even if they are but incidental to his writings, Augustine is generally recognized as the first great philosopher on the nature of time. Vonnegut parodies this viewpoint quite explicitly when he compares Rumfoord's palace "Dun Roamin" to "St. Augustine's City of God" (ST 296). On one level, Vonnegut's satire of Augustine coincides with his widespread refutation of traditional religious doctrine, as well as with Rumfoord's persistent atheism. On another, the text is clearly arranging itself against traditional linear narrative and the temporal schema this type of narrative represents. In other words, Vonnegut rejects the arguments of Book XI in Augustine's *Confessions* that time consists of distinct past, present, and future. These temporal categories coincide for Vonnegut.

Consequently, the universe of his novels is not eschatological; in fact, it denies eschatology. Even the version of the apocalypse given by the Tralfamadorians in *Slaughterhouse-Five* is not a true eschatology since it has already happened and continues to happen. When asked to explain why even with knowledge of how the universe ends, the Tralfamadorians do nothing to prevent this catastrophe, Billy's Tralfamadorian guide replies that the pilot "has *always* pressed it, and he always *will*. We *always* let him and

we always *will* let him. The moment is *structured* that way” (*SHF* 117). In essence, there is always an apocalypse; therefore there never is one. In this sense, the eschatology of Church dogma is incompatible with the revelations of the strange time in Vonnegut's novels.

At this point in the texts, a complex dialectic emerges between religion and science, one that hovers in the background of all Vonnegut's work. This dichotomy is especially present in *The Sirens of Titan* where the foundation of the Church of God the Utterly Indifferent clearly satirizes organized religion. In his jeremiad against the tyrannies of science, the preacher Bobby Denton says toward the outset of the novel that “[y]ou don't have to be a physicist or a great chemist or an Albert Einstein to understand [God's rules]” (*ST* 28). The preacher voices an incompatibility between science and religion that parallels the incompatibility between the sciences and humanities feared by C.P. Snow. Indeed, the second teaching of the fictional church, that “Luck is not the hand of God” (183), reminds us of Einstein's much misinterpreted statement that “God does not play dice.” Here, the author plays with the dubious relationship between skeptical science and revelatory religions. Indeed, Vonnegut's religious skepticism is well documented,²³ but it is the temporal considerations that become central to understanding the text.

According to Vonnegut's interpretation of Einsteinian relativity, there can be no ultimate genesis, no Creation as the definitive beginning of the cosmos. Rather, the texts subscribe to the system laid out by Rumfoord when he states: “Things fly this way and that, my boy . . . with or without messages. It's chaos, and no mistake, for the Universe

is just being born. It's the great becoming that makes the light and the heat and the motion, and bangs you from hither to yon" (34). Instead of the big bang, "bang" here in the text suggests the chaotic state of the universe and its inherent nonlinearity. The key phrase here is "the great becoming" since it emphasizes the simultaneous nature of the universe as seen by Rumfoord. The tense is always present; there is no single point in antiquity that signifies the beginning. Rather, the universe in this view is always in a state of creation. It is important to note that this view of Creation is not mutually exclusive with the Christian cosmogony Vonnegut seems to parody. For example, at the opening of *John*, the Logos exists eternally, *ex tempore*, and intimately aware of all time, a perspective of God later discussed by Aquinas.²⁴

The reversal of the Eden myths in the novels further intimates that Vonnegut is contesting the linear system of Christian eschatology. In *Forever Pursuing Genesis*, Mustazza suggests that one result of Billy's Tralfamadorian revelation is that "the sting of time is removed, its ability to corrode is undermined, and the tragic view that the aging process makes for is eliminated . . . as a result of time's nonlinear nature, no one really dies except in brief moments . . ." (113). In essence, Billy Pilgrim achieves Eden at the end of his quest rather than at the beginning. His revelation that time is not linear is the exact opposite of the Fall, where nonlinear cosmos becomes linear history. Likewise, Malachi Constant and Beatrice achieve something approximating Eden on Titan, at the end of their respective quests across time and space. These reversals suggests that Vonnegut does not subscribe to the traditional Genesis narrative but rather, in light of relativity and contemporary science, must reconfigure and indeed reverse these myths.

Nevertheless, like Shelley, Vonnegut cannot absolutely escape the metaphysics he is criticizing. Vonnegut acknowledges the need to engage religio-mythic themes in order to configure science within a larger matrix of ideologies. Through this interplay, Vonnegut situates the Einsteinian perspective of time beside the Judeo-Christian one, arriving at a liminal space where these worldviews might coexist. While this syncretic tendency underlies much of Vonnegut's work, it is not an analog for madness as some scholars have suggested. Mustazza, like others, suggests that the scenario is a construct of Billy's mind rather than a reflection on higher-dimensional space-time. For Mustazza, the Tralfamadorians "tell [Billy] what he desperately wishes were true" (113). Again, this recourse to hallucination as the explanation for the time structure of the novel is an avoidance of the ubiquitous role of relativity in the text.

In adopting relativity as its temporal foundation, the text certainly also satirizes time as the medium of progress. As Schatt notes, "[h]istory is the major subject of *The Sirens of Titan* since Vonnegut's focus is on whether or not human history is meaningful" (36). Here, I must disagree. It is time, of which history is but a trace (to co-opt the Ricouerean use of the term), which is Vonnegut's prime concern in the novel, along with the generating meaning in "a nightmare of meaninglessness without end" (*ST* 1-2). Much of the meaning injected into history derives from the myth of progress.²⁵ Vonnegut satirizes this myth particularly harshly in *The Sirens of Titan*. As Schatt deftly notes, "[w]hen the President of the United States makes a speech about the need for progress and for space research, his statement is ironical because history is not linear and because man is not moving toward a City of God" (36). Here in the text, we recognize that the

teleology refuted by Vonnegut is two-fold. On one hand, Vonnegut denies the eschatology of theological systems. On another, he denies the myth of progress. Mayo goes so far as to describe the entire novel as “a satire on progress” (17). In some sense, Vonnegut's refutation of linear time and the progress implied by such a system is also a refutation of Marx's belief in a teleological utopian revolution, the ultimate goal of linear time. For Vonnegut, there is no goal since time is not an arrow.

The fulfilled prophecies of Rumfoord likewise suggest that Vonnegut is using relativity as a springboard to deconstruct traditional ideas of history. We are right to question whether Rumfoord's actions deliberately cause the sequence of events or whether the effects prefigure his actions. Throughout the novel, Rumfoord affirms the necessity of his actions, consistently emphasizing the importance of Malachi's role in an ultimately absurd history. The revelation of the role of Tralfamadore in human history effectively renders history pointless and conforms to the suggestions of Fukuyama and Baudrillard that history “vanishes” in postmodern globalization.²⁶

Vonnegut suggests a similar notion, although globalization extends beyond the globe proper in his fictional scenario into deep space. Out there, with the future predetermined, history loses its salience. If time exists as a relative simultaneity, then all time is history, even the future. Consequently, no time is historically significant for Vonnegut. The text emphasizes this lack of significance in its discussion of the origins of Earth's monuments as trivial messages intended for Salo, the Tralfamorian messenger stranded on Titan. Architectural structures like Stonehenge and the Great Wall, ostensibly representing the pinnacles of human civilization, are reduced in the text to

mere messages about the imminent arrival of spare parts from Tralfamadore (276-277). In this context, history becomes an absurdity.

Furthermore, strange time as described by Vonnegut denies the reality of goals or any telos, much like Darwinian evolution by natural selection which he addresses in *Galapagos*. Again, the discussion of Vonnegut's trip to the World Fair at the outset of *Slaughterhouse-Five* intimately references linear history (18) and its inability to capture the realities of time in a post-Einsteinian society. Moreover, broken promises of the myth of progress appear throughout the work. In some sense, Vonnegut “focuses on patterns that defy human comprehension and suggests that humanity still suffers from Sir Francis Bacon's 'idols of the tribe,' the human need to observe order in a universe even when there is none” (Schatt 39). The search for meaning by the novel's characters is intricately bound to progress, itself a symptom of the phenomenology of linear time which Vonnegut rejects.

In both novels, evidence abounds that we as readers are no longer dealing with traditional, linear concepts of time. In *Slaughterhouse-Five*, the narrator states that “[t]ime would not pass. Somebody was playing with the clocks . . .” (20), a clear indication that measured time is no longer a valid tool in the fictional universe of the book. As Eco remarks, to the postmodern person, clocks “no longer speak of anything except themselves and their internal functioning” (58). That the clocks were altered is also an overt reference to the time dilation effects demonstrated in early relativity experiments.²⁷ At this point, we must suspend our disbelief, to co-opt Coleridge's phrase, and assume that the time of clocks, measured time, is no longer tenable. As Seneca

famously states, “facilius inter philosophos quam inter horologia conveniet” (Fitch 276).^{viii} Likewise, Malachi Constant notices that “[f]rom the wrist underwater came the glint of his solar watch. The watch had stopped” (*ST* 50). Again, we have a symbolic passage from the measured, “punctual” time of clocks to the more intricate simultaneity of relativity. The very description of humans walking on the Martian surface without spacesuits, using “goofballs” for respiration, and existing in a vacuum again reminds us that we have suspended the classical Newtonian-Aristotelian physics for one of pure concept. Since Einstein's theory cannot be disproven by traditional empirical methods, readers must assume its validity for the Vonnegut's fictions to function effectively.

But we are not merely in a realm of nonsense. Sigman and others have noted the abundance of Alice references in the works of popular scientists. Vonnegut co-opts this trend in *The Sirens of Titan*, and David Ketterer extensively compares *The Sirens of Titan* to *Alice in Wonderland* (Schatt 40).²⁸ While often dismissed as children's fantasy, the works of Lewis Carroll explore a variety of logical and mathematical problems with grand logical and philosophical implications.²⁹ Just as when Alice slips into a realm of thought experiment and logical play, when Malachi “lock[s] the Alice-in-Wonderland door behind him” (*ST* 7), the reader enters the domain of speculation where the laws of nature bend and where the rules of empirical testability become pointless. This is partially the domain of theoretical physics. Consequently, it is the realm of relativistic reasoning.

One result of this interpretation of relativity is the consideration of time travel. While the “paradoxes of time travel are oddities, not impossibilities” (Lewis 134), we

^{viii}Lit. “one can expect an agreement between philosophers sooner than between clocks”

must not dwell on the speculations of the actual likelihood of time travel. Instead, we must briefly consider time travel as a literary trope. From Wells onward, time travel has occupied a central place in the catalog of science fiction themes. Heinlein, Dick, and others treat the theme at length.³⁰ Usually, time travel narratives rely on mysticism or advanced technology. But, Vonnegut's use of time travel relies on neither; rather, it relies on the speculations surrounding Einstein's theory. With absolute time and space abolished by relativity, time travel becomes a serious topic of discussion among theoretical physicists. As Stephen Hawking notes, looking out into space we are looking back into time (39), a conclusion directly deduced from Einsteinian relativity.

This connection between time travel and relativity undoubtedly affects Vonnegut's text. In fact, he admits: “. . . I honestly believe I am tripping through time. Tomorrow I will be three years old again. The day after that I will be sixty-three” (*WFG* 2). He elaborates upon this idea in his experimental hybrid of fiction and nonfiction, *Timequake*. Indeed, the premise of *Timequake* is “a sudden glitch in the space-time continuum” that causes “everybody and everything [to] do exactly what they'd done during a past decade, for good or ill, a second time” (xiv-xv). Throughout the work, Vonnegut bounces freely between time periods as he does in *Slaughterhouse-Five*. Again, the premise emphasizes Vonnegut's concern with post-Einsteinian reality and the consequences of simultaneity. While certainly whimsical to a degree in these works, Vonnegut is seriously commenting on the untenable nature of linear time. As Einstein notes in a condolence letter to a friend's widow, “for we convinced physicists, the distinction between the past, the present and the future is only an illusion, however persistent . . .” (qtd. in Goodheart 44).

This perspective accords with that of both novels where the fabric of space-time informs the fabric of the text.

Consequently, strange time suggests another hypothesis, one that forms the crux of Vonnegut's temporal schema. Both Bertrand Russell and Hilary Putnam³¹ argue that relativity implies what physicists call a block universe, “a multidimensional space-time manifold” (Lockwood 249). The evidence that Vonnegut is describing a block universe pervades *The Sirens of Titan*. Among the most noticeable references to his adoption of Minkowskian space-time is the repetition of the phrase “space eternal” (135) throughout the novel.³² Vonnegut uses it three times, drawing our attention to the seemingly incongruous use of a spatial adjective with a temporal noun. Certainly, Vonnegut is emphasizing the identification of his time system with Minkowskian space-time. Incidentally, this implies a block universe.

Rumfoord, as the voice of a relativistic perspective in the novel, also describes a block universe. He declares that “[e]verything that ever was will be, and everything that ever will be always was” (292). This proclamation describes a block universe. But, we must be careful not to confound Rumfoord's argument with those of the Eternal Return, associated most frequently with Nietzsche and Eliade.³³ Rumfoord's universe is not strictly a recurring sequence but a simultaneity. As Paul J. Nahin notes, chronosynclastic infundibulated time parodies the temporal vision of Boethius's God, who sees all temporal reality at once (115). Rumfoord suggests a similar perspective. When he dematerializes for the last time, he reinforces this distinction in a revealing “deathbed” speech: “Whatever we've said, friend, we're saying still – such as it was, such as it is,

such as it will be” (302). The co-existence of all time is explicit here in the text.

Furthermore, not only is this statement highly religious in nature, but it is also extremely metafictional. As characters in a text, Rumfoord and the others are in some sense engaged in a perpetual conversation.

Based upon his arguments, Rumfoord's condition bears striking similarities to that of Dr. Manhattan in Alan Moore's seminal graphic novel *Watchmen*.³⁴ Like Rumfoord, Manhattan sees all time at once. In essence, he experiences the universe as a block universe, in accordance with the suggestions of Einsteinian relativity. As Manhattan explains to Laurie, “There is no future. There is no past . . . Time is simultaneous, an intricately structured jewel that humans insist on viewing one edge at a time, when the whole design is visible in every facet” (6). This observation finds a remarkable parallel in Rumfoord. Another figure who experiences symptoms similar to Rumfoord's and Manhattan's is the Red Queen in Lewis Carroll's *Through the Looking Glass*. Like Rumfoord, the Red Queen remembers events that have not yet occurred. In all three cases, the events of the universe are certainly preordained due to the pre-existence of the future in a block universe.

Vonnegut co-opts the concept of a block universe more explicitly in *Slaughterhouse-Five*. From the outset, the reader is bombarded with juxtapositions of time and space. For example, the narrator introduces the first and last lines of the novel simultaneously: “It begins like this: *Listen: Billy Pilgrim has come unstuck in time*. It ends like this: *Poo-tee-weet?*” (22). Similarly, when we first encounter characters, we are often told of their death before we even know of the circumstances of their fictional

lives. Before we ever meet Edgar Derby, we know that “. . . the climax of the book will be the execution of poor old Edgar Derby . . . arrested in the ruins [of Dresden] for taking a teapot. And he's given a regular trial, and then he's shot by a firing squad” (4-5). We are immediately reminded of a line by Borges, “Know that in some sense you are already dead” (Borges *Poems* 221). This type of juxtaposition emulates the event structure in a block universe.

These structural elements parallel the phenomenology of time posited by the Tralfamadorians in the novel. According to their view, “All moments, past, present, and future, always have existed, always will exist.” (*SHF* 27). Perhaps the most complete explication of this idea occurs in a conversation between Billy Pilgrim and his Tralfamadorian guide :

“Where am I?” said Billy Pilgrim.

“Trapped in another blob of amber, Mr. Pilgrim. We are where we have to be just now – three hundred million miles from Earth, bound for a time warp which will get us to Tralfamadore in hours rather than centuries.”

“How – how did I get here?”

“It would take another Earthling to explain it to you. Earthlings are the great explainers, explaining why this event is structured as it is, telling how other events may be achieved or avoided. I am a Tralfamadorian, seeing all time as you might see a stretch of the Rocky Mountains. All time is all time. It does not change. It simply *is*. Take it moment by

moment, and you will find that we are all, as I've said before, bugs in amber.” (85-86)

The above passage strongly suggests a block universe and echoes the sentiments of Rumfoord. When we read these passages together, we come to a firmer understanding of what Vonnegut is attempting to relate, namely the possibility that time is simultaneous. Billy also offers a staunch refutation of any Berkeleyan considerations and any possible idealist escape from strange time when he states that “[i]t is just an illusion we have here on Earth that one moment follows another one, like beads on a string, and that once a moment is gone it is gone forever” (27). Linear time here becomes a Kantian phenomenon; it is relative time, the sort of time that constitutes block universes, which constitutes noumenal reality.

No passage indicates this identification of Vonnegutian strange time with block universes as much as the opening of Chapter Five in *Slaughterhouse-Five*:

Billy Pilgrim says that the Universe does not look like a lot of bright little dots to the creature from Tralfamadore. The creatures can see where each star has been and where it is going, so that the heavens are filled with rarefied, luminous spaghetti. And Tralfamadoreans don't see human beings as two-legged creatures, either. They see them as great millipedes – 'with babies' legs at one end and old people's legs at the other,' says Billy Pilgrim. (87)

This passage expresses a distinctly Einsteinian idea, frequently dubbed a “spacetime worm” (Kennedy 51). The idea supposes that an observer could hypothetically envision

an object moving through both time and space in its totality. Here in the text, Vonnegut is distinguishing between persistence and endurance, the former describing an object moving in time, the latter a sequence of events that creates the illusion of persistence. Similarly, this section of the text might imply something akin to Zeno's paradox. An object according to this concept of time does not move *per se*; rather, it exists as a series of static states which are only perceived as motion. Indeed, “[t]here is [to Tralfamadorians] simultaneity of space as well as time . . .” (Leeds and Reed 151). While the connections between Zeno's and the Tralfamadorians' scenario are tempting, we will not treat them here. Another possibility is that Vonnegut's block universe provides us with an example of a type of universal temporal memory, akin to what J.T. Fraser refers to as “ever-presence.”³⁵ Both this idea and Vonnegut's novel entertain the possibility that the universe retains traces of all events across all space-time coordinates. Essentially, Billy is describing a block universe and its effects on individual bodies.

A similar metaphor appears in *The Sirens of Titan* when Rumfoord states that “life for a punctual person is like a roller coaster” (54). The difference between Beatrice and Rumfoord is that Rumfoord ““can see the whole roller coaster,”” just as the Tralfamadorians can see the entirety of a human life in one instant. In both instances, time from an omniscient view is a simultaneity. All events exist already, and it is human subjective consciousness that experiences them in a linear mode. Importantly, Rumfoord does not dictate the events along the metaphorical rollercoaster of space-time. Rather, he “just know[s] what it's shaped like” (54). Rumfoord, freed of “punctual” perceptual constraints, actually sees the full dimensionality of a block universe.

Block universes are not unknown in the fiction of Vonnegut's contemporaries. A particularly relevant parallel to Vonnegut's Tralfamadorian time can be found in Borges's "Tlön, Uqbar, Orbis Tertius," a highly experimental fiction from his intricate *Labyrinths*. In fact, the similarities between Vonnegut's Tralfamadore and Borges's Tlön are remarkable. Borges, explaining the philosophy of Tlön, writes:

One of the schools of Tlön goes so far as to negate time: it reasons that the present is indefinite, that the future has no reality other than as a present hope, that the past has no reality other than as a present memory. Another school declares that *all time* has already transpired and that our life is only the crepuscular and no doubt falsified and mutilated memory or reflection of an irrecoverable process (10)

This passage from one of Borges's more widely known fictions corresponds exactly to Vonnegut's Tralfamadorian explanation of time. Time is simultaneous and ever-present for Borges. Like the Tralfamadorians, the inhabitants of Tlön consider linear time to be an illusion in the tradition of Kant.

The Kantian idealism³⁶ underlying Vonnegut's conception of strange time also becomes clear when we recognize time as an illusion of the mind. Kant suspected as much and, if we take the Tralfamadorians as objective external observers who exist *ex tempore*, then this supposition becomes a central point in Vonnegut's work. If time is a symptom of human psychology, then we exist like Flatlanders, unaware of the higher dimensionality at work in the universe. Parallels between Abbott's Victorian

investigation into higher dimensions abound. Malachi Constant is certainly analogous to A. Square, while Rumfoord functions as an analog of Lord Sphere. Only through insufficient verbiage can Rumfoord possibly attempt to explain the consequences of chrono-synclastic infundibulated time. Unfortunately, unlike A. Square who benefits from personal experience of higher dimensions in *Flatland*, Constant never truly glimpses the full scope of Rumfoord's universe. As Terry Eagleton notes, “[i]t may well be that cultural habits like imagining time as flowing forward, or perceiving other human bodies as persons, run so deep in us that we could not possibly think ourselves outside them” (59), a dilemma consistent with Constant's. Similarly, the narrator of *Slaughterhouse-Five* acknowledges his incapacity to truly perceive spacetime when he admits that “[t]here was nothing I could do about it . . . [a]s an Earthling, I had to believe whatever clocks said – and calendars” (*SHF* 20). Like A. Square, Malachi and the narrator both can never truly escape their linear existence, despite being aware of alternative perspectives.

Rumfoord's continuing attempts to express his vantage point to Malachi continues the *Flatland* comparison. For example, Rumfoord compares his simultaneous consciousness to fortune-telling in “a punctual way of speaking” (20), drawing attention to the dimensional differences in the characters' respective points of view. In some sense, Rumfoord accommodates his language for the other “punctual” characters, much as Raphael does for Adam in Book IX of *Paradise Lost*.³⁷ The repeating references to punctuality as a metaphysical state summarize the inability to truly communicate the Einsteinian phenomenology of time. As we find, “Constant existed as a point – could not

imagine what it would be like to exist in any other way” (*ST* 7) in much the same way that the Flatlanders, Linelanders, and Pointlanders cannot possibly conceive of higher dimensions.

Conversely, Rumfoord never seems to exist punctually. In fact, the closest he comes to existing as anything less than a four-dimensional wave phenomenon is when sunstorm interference gives Rumfoord and his dog Kazak a “two-dimensional look” (*ST* 285). Even the narrator assumes a satiric voice when discussing punctual time, explaining at the novel's outset that “[t]o be punctual meant to exist as a point, meant that as well as to arrive somewhere on time” (7). Like Rumfoord and the Tralfamadorians, the narrator of *The Sirens of Titan* exists *ex tempore*. Mayo notes that *The Sirens of Titan* “opens with a device which has become common to Vonnegut, a narrator who provides a perspective in time and space outside the novel's framework, much like that of a visitor from outer space” (15). The narrator's removed voice and his opinion of “punctual time” reflects A. Square's opinions of both Lineland and Pointland. In both cases, A. Square cannot communicate his own dimension to those of lower dimensions. This lack of communicability likewise afflicts the characters in Vonnegut's novels, themselves commenting on the difficulty of describing relativistic time.

Nevertheless, what Rumfoord and the Tralfamadorians do successfully communicate is how relativistic block universes affect the traditional concept of death's finality. Death, in light of strange time, becomes largely irrelevant. As Broer states, “Death, from the Tralfamadorian view, no matter how horrible, can have no significance” (95). Since human life in a block universe occupies an infinite amount of time in a finite

space, the conclusion of life is but an illusion. Rather than being the end of one's *Entwurf*^{ix} or “the closure of all . . . projects” (Carr 81), death assumes a harmless aspect when viewed through this lens. As Billy Pilgrim observes, death “is simply violet light and a hum. There isn't anybody else there. Not even Billy Pilgrim is there” (*SHF* 143). In Vonnegut's universe, death becomes a temporary state, no more significant than any other point along the strange loop of life.

A final note of block universes leads us to an interesting metafictional consideration. The novels themselves as artifacts represent time much like a block universe. This is interesting considering the nonlinear structures explored by Vonnegut. The universe of the text exists simultaneously; the objective observer exists *ex tempore* like the narrator in *The Sirens of Titan* or the Tralfamadorians in both novels and perceives the entirety of events in one manifestation. This contradicts Carr's dictum that a “text is no different from anything else: without time it can have no beginning, middle, and end. Its sentences are *spatially* arranged . . . but unless it is gone through temporally it neither begins nor ends. It just sits there on the shelf. And its only middle is a spatial point equidistant from its edges” (Carr 51). Vonnegut defies this rather Aristotelian typology. The implications here are interesting for philosophers of art as well as for scholars interested in the difficulty of representing time accurately through interpretive arts.

The novel being “somewhat in the telegraphic schizophrenic manner of the tales of the planet Tralfamadore” per its subtitle indicates that form occupies a central concern in *Slaughterhouse-Five*.³⁸ Mayo states that *Slaughterhouse-Five* “presents these ideas,

ixFor Heidegger, “the project”, the primary means of analyzing human existence

however, in a style which is continuing to develop, and which is moving significantly closer to the form which might be called the Gestalt Novel, the form of *Breakfast of Champions* and *Slapstick*” (45). While this is certainly accurate, I believe Vonnegut is going one step further in attempting to express something approximating the simultaneous block universe posited by the Tralfamadorians in the novel itself. They attempt to convey what Jung called “synchronicity,” defined as a “fusion of simultaneity and meaning, creating a sense of Baudelarian correspondences or coincidences between seemingly unconnected events” (Leeds and Reed 149). Such a description of Tralfamadorian novels is strikingly similar to the effect of Vonnegut's own novel: “Billy couldn't read Tralfamadorian, of course, but he could at least see how the books were laid out – in brief clumps of symbols separated by stars. Billy commented that the clumps might be telegrams.” (*SHF* 88). This presentation of simultaneous ideas mirrors Vonnegut's own novel. As the Tralfamadorian responds:

There are no telegrams on Tralfamadore. But you're right: each clump of symbols is a brief, urgent message – describing a situation, a scene. We Tralfamadorians read them all at once, not one after the other. There isn't any particular relationship between all the messages, except that the author has chosen them carefully, so that, when seen all at once, they produce an image of life that is beautiful and surprising and deep. There is no beginning, no middle, no end, no suspense, no moral, no causes, no effects. What we love in our books are the depths of many marvelous moments seen all at once time (88)

The Tralfamadorian novel, explored as a critical theory itself by Marc Leeds,^x finds a remarkable parallel in the closing lines of Marquez's *One Hundred Years of Solitude*, when Aureliano realizes that Melquiades “had not put events in the order of man's conventional time, but had concentrated a century of daily episodes in such a way that they coexisted in one instant” (446). Like Borges's *Tlön* and the novels of Tralfamadore, the text of Melquiades's manuscript depicts a simultaneity in the sense I am describing here.³⁹

Due to the inherent restrictions imposed by the linearity of writing, the analog between form and content is not perfect. Yet, to use MacLuhan's well-worn phrase, the medium is the message. A simple test is to begin the novel at any point and garner the same effect as a “traditional” linear reading. Not even Joyce achieves this effect perfectly. Likewise, Vonnegut fails to craft a perfectly simultaneous novel in the style of Tralfamadore.⁴⁰ Constantly concerned with form, the narrator describes his draft of the manuscript that becomes the book itself as being outlined “on the back of a roll of wallpaper,” composed of intersecting lines drawn in crayon representing characters (*SHF* 5). While this representation aligns itself with Tralfamadorian plot construction, it cannot be accurately reproduced in the form of a book. The plots of both novels reflect recursive circularity and a telegraphic presentation of events, but the textual arrangement does not. Indeed, order creates specific effects, enhancing relevance of otherwise trivial events. That is, of course, only true of the first reading. Further reading may effectively begin anywhere in the text. Rereading a novel is perhaps the best metaphor for

x See Leeds's “Beyond the Slaughterhouse: Tralfamadorian Reading Theory in the Novels of Kurt Vonnegut.”

Vonnegut's time structure. To pursue the metaphor of time as book, reality is quite like a novel with its plot written but as yet unrealized until processed by human consciousness (or at least convincingly creates the illusion that time is passing). The metaphor is seamless, and the ramifications span beyond the limits of the present inquiry.

Frequent critical comments dismiss *The Sirens of Titan* as a parody of space opera or as an attempt to understand man's inward search for meaning during a time when meaning was believed to be out in space. Yet, to ignore the ramifications of Vonnegut's treatment of time as both internal and external phenomenon is to miss the aesthetic importance of Vonnegut's approach. Had the external space-time been intended solely as parody, Vonnegut would likely not have used the same technique in his masterpiece *Slaughterhouse-Five* and all of his subsequent novels. Thus, while humanity's inner search for meaning occupies a central role in both texts, it is interwoven with the effects of relativity on such a quest. The existential overtones in both works reinforce Vonnegut's argument that neither progress nor eschatology make any sense in light of relativity. A new system must be erected, one wherein the individual accepts his fate and laughs at the absurdity of the cosmos. Relativity, and indeed the scientific system which spawned it, offers no answers to such grand questions about the meaning of life.

Vonnegut accepts that, his characters accept that, and so it goes.

If we are to believe Lyotard's accusation that the postmodern rejects metanarratives, we can only read Vonnegut's work as pure cynical satire and disregard attempts to excavate serious philosophical meaning from his work. To do this would cheapen the text. Indeed, despite the satirical nature of his work, Vonnegut engages deep

issues concerning contemporary philosophy. Often jokes function as coping mechanisms for wrestling with serious issues; Vonnegut's alleged black humor is no different. As Klinkowitz notes, "Only within these hallowed, crazy spaces of the joke can we get a glimpse of what may really be going on" (*Kurt Vonnegut* 49).

Vonnegut, like ourselves, cannot escape from the "facts" of science, from the cultural logic ubiquitous in a world aware that relativity is scientific fact. He cannot disregard the reliance of rational, postmodern man on empirical science, nor can he ignore the new myths⁴¹ of big bangs, tectonic plates, and evolution by natural selection. These metanarratives inform his text, lend credence to his fictions. Physics provides enough air to inflate his seemingly schizophrenic prose into a believable sphere. Without relativity, and indeed without Gödel's corollary (which is our next subject), Vonnegut's time travel novels would cease to function meaningfully. They provoke precisely because they resemble truth, or at least a prevailing discourse of truth like relativity.

Yet, Gödel universes notwithstanding, Vonnegut does not embrace Einsteinian relativity without trepidation. His texts are relative only insofar as they are subjective, both in mode of production and in mode of creation. Reference frames become subjects; absolute time becomes illusion. Importantly, this knowledge of nonlinear, relative strange time never improves the narrators' positions. Generally, the narrators' awarenesses of the phenomenon depresses them further about reality and humanity's place within it. Truth dissolves the certitudes of naïvete, and all of Vonnegut's characters, from Malachi Constant/Unk/The Space Wanderer to Winston Niles Rumfoord to Billy Pilgrim to Vonnegut himself as he manifests in the texts, become disenchanting by their

respective revelations about the nature of time. Time is not linear: the statement foists a problematic upon our hallowed (but notoriously unreliable) commonsense; however, there are more disconcerting effects on the discourses of free will, fatalism, and intentionality. If Vonnegut's texts posit, as I have argued, a relativistic block universe as a noumenal reality of the universe, then paradoxes become epidemic. An investigation of these paradoxes in light of strange loop phenomena will likely resolve many of these issues.

CHAPTER THREE

“STRAIGHT AS A STRING”: STRANGE LOOPS AND VONNEGUT

Kurt Gödel, renowned mathematician and colleague of Einstein, proposed a revolutionary corollary to relativity in 1949.⁴² In a much-cited comment in a subsequent paper, he states that the “relativity of simultaneity” leads to:

an unequivocal proof for the view of those philosophers who, like Parmenides, Kant and modern idealists (such as MacTaggart), deny the objectivity of change and consider change as an illusion or appearance. The argument runs as follows: change becomes possible only through a lapse of time. The existence of an objective lapse in time, however, means that reality consists of an infinity of layers of 'now' which come into existence successively. But, if simultaneity is relative, reality cannot be split up into such layers in an objectively determined way. Each observer has his own set of 'nows' and none can claim the prerogative of representing the objective lapse of time (“A Remark” 557)

While little discussed in the popular media, the idea of a Gödelian universe resonated with physicists, with several failed attempts to disprove it manifesting in subsequent years.⁴³ But it is the idealism which Gödel espouses that is truly remarkable. In an era when idealism was largely displaced by other empirical philosophical systems, Gödel

had the audacity to claim “that at least in one point relativity has furnished a very striking confirmation of Kantian doctrines” (“Some Observations” 230). I have already noted the Kantian idealism inherent in Vonnegut's presentation of time, but Gödel's proposal deepens this connection.

In one sense, Gödel is arguing for a type of block universe interpretation of Minkowskian space-time. As I argued in the previous chapter, this is precisely what Vonnegut presents in *The Sirens of Titan* and *Slaughterhouse-Five*. On a deeper level, Gödel suggests a more complex model of the universe, one that agrees with the proposals of a block universe but implies other consequences. The first consequence of Gödel's theory is a universe that posits the existence of “close timelike curves,” each of which “is [a curve] that is joined up to itself – a curve that forms a closed loop in space-time” (Lockwood 125).⁴⁴ In other words, Gödel proposes a universe that is “spatially and temporally infinite” but that rotates (126).

Gödelian universes represent a firm mathematical basis for the possibility (though not necessarily the actuality) of time travel.⁴⁵ No matter how far you travel in a Gödelian universe at speeds exceeding the speed of light, you return to the point of origin. Significantly, the return to the point of embarkation is a major criterion for a strange loop. As I mentioned earlier, Hofstadter defines a strange loop,^{xi} as a “phenomenon [that] occurs whenever, by moving upwards (or downwards) through the levels of some hierarchical system, we unexpectedly find ourselves right back where we started” (*GEB* 10). In short, Gödel posits that Einsteinian relativity allows for a rotating universe that loops back upon itself in the manner of a strange loop.

xi Also referred to as a Tangled Hierarchy

As I argued in the previous chapter, Vonnegut's fictional universe in both novels approximates a block universe. However, his novels go significantly further than that: the texts pose the possibility that the universe itself is a strange loop that operates much like a Gödelian universe. While Bloom calls structure “an absurd term to apply to almost any novel by Vonnegut” (1), there is certainly an underlying structure in the way he represents time. This structure is akin to what Kathryn Hume has called *exostructure*, composed of “devices that impart meaning yet which Vonnegut treats with a good bit of suspicion” (Mustazza 17). While Vonnegut's skepticism of both religious and scientific doctrines is an integral feature of his fiction, the recurrence of such exostructures reinforces his perspective on time. His recourse to this method of representation in subsequent novels, notably *Bluebeard* and *Slapstick*, supports the argument that Vonnegut carefully considers the ramifications of his temporal philosophy on the structure of his narratives. Specifically, it is a strange loop exostructure, as a corollary to block universes, that emerges through a careful examination of the texts.

In the preface to *Wampeters, Foma, and Granfaloons*, Vonnegut presents a concise, if slightly contradictory, summary of his opinion on the phenomenology of the Universe:

Here is my understanding of the Universe and mankind's place in it at the present time: The seeming curvature of the Universe is an illusion. The Universe is really as straight as a string, except for a loop at either end.

The loops are microscopic.

One tip of the string is forever vanishing. Its neighboring loop is forever

retreating from extinction. The other end is forever growing. Its neighboring loop is forever pursuing Genesis (xxii)

Here, Vonnegut confounds the relativistic viewpoint he expresses earlier in that same preface with a species of Berkeleyan, or more appropriately Kantian, idealism. He affirms the infinite nature of the universe while implying a loop architecture. Though he maintains his characteristic whimsy on the subject, Vonnegut asserts that the universe cannot truly exist as it appears to our perceptual systems. In its suggestion of an underlying loop structure, the passage provides an intriguing line of inquiry and an appropriate starting point for our investigation of strange loop phenomena in Vonnegut's fiction.

Gödel's postulates introduce us to complex mathematics and theoretical physics that we will not delve into here.⁴⁶ More importantly, they introduce us to the phenomenon of strange loops. As I mentioned earlier, Hofstadter's monumental study *Gödel, Escher, Bach: An Eternal Golden Braid* elaborates the ubiquitous nature of strange loops and is indispensable for any scholar seeking an intricate explanation of strange loops.⁴⁷ For my current investigation, a list of the criteria denoting a strange loop is sufficient to consider the strange loop qualities of Vonnegut's fiction. First, strange loops are recursive. Recursion implies a feedback network where events in a sequence inform subsequent events.⁴⁸ However, we must distinguish “recursive definitions from circular ones” (*GEB* 133). While strange loops certainly imply a certain circularity, we must be careful not to identify the logic of tangled hierarchies with purely circular representations. Second, strange loops are nonlinear. There is no requisite starting point

or finish line; there is no beginning, middle, or end. Third, strange loops imply infinity. Hofstadter illustrates these criteria through an abundance of examples, and they represent the primary characteristics of strange loops.

Hofstadter's work illustrates the ubiquity of strange loops across disciplines but, outside of his references to Lewis Carroll's work, he does not address this phenomenon in literature. As Hofstadter notes, Gödel's Incompleteness Theorem proceeds in the tradition of Lewis Carroll, the *nom de plume* of mathematician Charles Dodson (whose Alice books we discussed briefly in the previous chapter in relation to Vonnegut's texts). However, the effect of Carroll's work reaches deeper than his fantasy literature, directly informing Vonnegut's time scheme. Certainly, the "Alice-in-Wonderland door" of the Rumfoord mansion explicitly invokes this influence.⁴⁹

As a mathematician, Carroll prefigures the proofs of Gödel, in spirit if not in fact. In Carroll's fictions, one finds a mathematician's basis for Vonnegutian strange time. The mathematics are crucial since recursive systems function within clearly defined algorithmic parameters, thoroughly outlined by Hofstadter. The Carroll Paradox illustrates this nicely, whereby chains of reasoning must repeatedly, indeed infinitely, reaffirm their own validity.⁵⁰ Such behavior manifests in the events Vonnegut's Tralfamadorian novels. For example, Rumfoord's motivation for amassing the Martian Army and staging a war with Earth is validated by the Tralfamadorian's use of Rumfoord to orchestrate events so Malachi's son Chrono can deliver replacement parts to Salo, the Tralfamadorian messenger and friend of Rumfoord trapped on Titan. This tangled hierarchy is something of a Carroll Paradox. In other words, to fulfill Salo's mission,

Rumfoord must manipulate certain events, but his doing so is itself manipulated by his knowledge that he will inevitably perform these actions. As Hofstadter, intentionally mimicking Carrollian language, notes of this type of recursive system, “[t]he moves change the rules, the rules determine the moves, round and round the mulberry bush” (*GEB* 688).

I must stress that Vonnegut's texts are not unique in exhibiting features of strange loops, and investigating parallels of his temporal scheme in other texts is necessary to illustrate a thorough description of Gödel's contributions to strange time. Perhaps the most extreme consequence of Gödel's theory is the possibility of time travel into the past,^{xii} and science fiction writers who adopt this trope often create strange loops as a result. In his exhaustive study of time travel, Paul J. Nahin discusses the trope across the disciplines of physics, philosophy, and literature. Although Nahin does not mention the idea of strange loops in his work, the concept is implicit in ideas like closed timelike curves and Gödelian universes, which he discusses at length. In these discussions, it is evident that the closed timelike curves implied by Gödel's theory are the most viable explanation for any possibility of time travel. As Palle Yourgrau mentions, “Gödel, the union of Einstein and Kafka, had for the first time in human history proved, from the equations of relativity, that time travel was not a philosopher's fantasy but a scientific possibility” (6). Vonnegut's incorporation of Einsteinian relativity into his fiction inevitably leads him to consider these same consequences.

Alasdair Richmond, following John Earman, has distinguished several species of time travel, notably Gödelian, Wellsian, and Nietzschean varieties. Unlike the device in

xii Einsteinian Relativity already allowed for hypothetical time travel into the future

Wells's *Time Machine*, A. J. Deutsch clarifies that a Gödelian time travel (GTT) machine isn't "an exotic sort of vehicle, but an exotic sort of place" (qtd. in Nahin 306). This accords with the chrono-synclastic infundibulum in *The Sirens of Titan*, which (according to Vonnegut's pseudo-reference book *A Child's Cyclopedia of Wonders*) we've already discussed as a place "where all the different kinds of truths fit together as nicely as the parts in your Daddy's solar watch" (9). Richmond does raise a valid caveat cautioning readers not to conflate the strange loops of Gödelian time travel with the eternal recurrence of Nietzsche: "Both [eternal recurrence and cyclic time] are endless, but eternal recurrence is infinite linear repetition of similar events, and circular time is finite but nonlinear" (308). Strange time in Vonnegut's texts is more akin to what Richmond calls *circular time*.⁵¹ Literary time travel is widely discussed in this context.

We find early evidence of this type of narrational structure in the work of Robert A. Heinlein.⁵² In "All You Zombies—," a bar patron (variously named Jane, the Unmarried Mother, and the bartender) experiences a hermetic variety of the grandfather paradox.⁵³ At the end of Heinlein's narrative, we discover that the narrator is simultaneously its own father, wife, and child due to an intricate series of sex changes and time travel events. Necessarily, the events unfold continuously in the same pattern with the same result, even after the secret unfolds. The narrator, himself a future version of Jane, comments on the metaphysics of such a universe, where events already exist: "A thing either is, or it isn't, now and forever amen" (45). This pre-existence suggests a block universe like Vonnegut's fiction, but it also adds the dimension of a strange loop. In fact, the bartender wears an Ouroboros ring that implies such a loop, a representation of "the World Snake

that eats its own tail, forever without end. A symbol for the Great Paradox” (38). The Ouroboros is an appropriate symbol for a strange loop, and one that Heinlein refers to repeatedly in the story. Having read the entire narrative, the reader ends the story at the point of embarkation, having actually traveled along a narrational strange loop.

Philip K. Dick also explores this type of temporal strange loop in “A Little Something for Us Tempunauts.” Addison Doug's prevention of his own death in Dick's story “virtually guarantees the locking in of an absolutely unyielding loop” (Richmond 307). As Doug admits, “”We're in a closed time loop . . . we keep going through this again and again” (Dick 404). This eternally repeating sequence is a variety of strange loop that bears a striking resemblance to the configuration of time presented by Billy Pilgrim and Winston Niles Rumfoord. Both of Vonnegut's characters confess a reality that approximates what Dick calls “Emergence Time Activity” (413), itself a species of strange loop. Specifically, Dick's story introduces a type of *causal loop*, defined as “close causal chains in which some of the causal links are normal in direction and others are reversed” (Lewis 140). Like the chrono-synclastic infundibulated Rumfoord or the “unstuck” Billy Pilgrim, the tempunauts experience a continuous repetition of events.

The strange loop features of Vonnegut's fictions finds parallels in the works of other postmodern authors outside the genre of science fiction. John Barth's *Lost in the Funhouse* contains a variety of stories with strange loop qualities. “Frame-Tale” illustrates this connection seamlessly. If one follows the author's instructions and configures the page as suggested, the line “Once upon a time there was a story that began . . .” (1-2) loops back upon itself. Physically, the page folds like a Möbius strip, a three-

dimensional form with one surface and one edge that loops upon itself. Hofstadter cites Escher's painting *Möbius Strip* as one of many examples of the painter's foray into strange loop representation. Like a strange loop, the story (if one can even use that label for Barth's piece) repeats itself endlessly, both in content and form. This tangled hierarchy structure reflects the type of narrative structure we encounter in both *The Sirens of Titan* and *Slaughterhouse-Five*.

The title story "Lost in the Funhouse" further exemplifies this identification. As Ambrose navigates the labyrinthine structure, he realizes "we will never get out of the funhouse" (Barth 74). In other words, he loses himself in a strange loop. Billy Pilgrim and Rumfoord are likewise trapped within temporal funhouses, unable to ever escape the loops of their simultaneous existences. Barth, like Vonnegut, is largely commenting on the nonlinearity of time as understood by postmodern authors. More importantly, Barth's fictions suggest that strange loops can function as an essential means of describing reality, just as Vonnegut's fictions do.

The image of a Möbius strip is an excellent metaphor for strange time. It exists simultaneously, but if one travels in a linear path along the surface, eventually one returns to the point of departure. Several science-fiction authors have adopted the Möbius strip as an approximation of the structure of time, notably Arthur C. Clarke in "The Wall of Darkness." In that narrative, the curious Shervane traverses the fabled Wall only to end up back where he started. The shaman-figure Grayle elucidates the human discomfort with the idea of the Wall when he suggests that "[w]e can imagine no ending to space, yet our minds rebel at the idea of infinity" (116). He proceeds to explain the

structure of the universe as a Möbius strip with a piece of paper, “an example in two dimensions of what really must occur in three” (117). The phenomenon Clarke is suggesting manifests a space-time structure that loops back upon itself, much like Gödel's proposal or the temporal suggestions of Vonnegut's fiction. Slusser and Chatelaine suggest that Heinlein's “By His Bootstraps” also suggests time as a similar sort of Möbius strip, stating of such a structure: “If its curve means it will be told again, endlessly in fact, the curve is a Möbius band” (180). In Vonnegut's texts, the timeline of Billy Pilgrim is also something of a Möbius strip, as is the roller coaster reality proposed by Rumfoord. Both of these images approximate the Ouroboros I mentioned previously or, better yet, the lemniscate symbol often used as a symbol for infinity itself.

Another crucial author to consider when discussing literary strange loops is one whose fictions we have previously discussed as similar to Vonnegut's: Jorge Luis Borges. The scholarly literature has thoroughly discussed the labyrinthine quality of Borges's fictions and his fascination with metaphysics. However, Allene M. Parker has gone significantly further in arguing that Borges's fictions manifest strange loop phenomena. Parker suggests that Borges represents a “fourth master” alongside Gödel, Escher, and Bach.⁵⁴ The parallels between Vonnegut's strange time and the speculations of Borges bring us to a common underlying theme, namely that nonlinear strange time is a species of strange loop itself.

In her comparative study of Escher and Borges, Parker focuses on four Borges fictions as examples of strange loops: “The Circular Ruins,” “The Secret Miracle,” “The Library of Babel,” and “Tlön, Uqbar, Orbis Tertius.” As Parker notes, all of these

fictions “are constructed around the themes of dreams and infinity” (14). In “The Circular Ruins,” the role of the dreamer as a figment of another person's dream implicates an infinite regression, often implicit in strange loops. This relationship echoes the role of Rumfoord, who controls the invasion of the Martian Army only to reveal that he himself is controlled by Tralfamadore. Another relevant parallel exists in “The Library of Babel.” The infinite library is itself a strange loop, and it serves as an appropriate symbol for the universe itself (or perhaps it represents an even larger matrix of all possible worlds). Vonnegut's literary universe approximates such a library insofar as it is infinitely recursive and nonlinear.

In addition, the Library of Babel resembles the temporal structure discussed by Borges in his nonfiction,^{xiii} first expounded by J.W. Dunne in his *An Experiment with Time*. For Dunne and Borges, time is an infinite hierarchy of “static time dimensions” like a Chinese box (to use Dunne's metaphor), presided over by the dynamic “absolute time” of conscious observers (Lockwood 16). This Chinese box metaphor is certainly a strange loop and a convenient metaphor for strange time. Like Tralfamadorian time, Dunne's theory presents all events as simultaneous and, more importantly, as infinite as well. Borges's essays, drawing on Dunne and others, formulates a version of strange time that coincides with Vonnegut's.

In considering the role of strange loops in Vonnegut's fiction, it is important that we next consider the theme of infinity that pervades *The Sirens of Titan*. Vonnegut's constant references to “space eternal” (135) emphasize the unending expansiveness of

xiii Most explicitly in “Time and J.W. Dunne” and “A New Refutation of Time,” both published in his *Selected Non-Fictions*.

the universe. Indeed, mankind's preoccupation with outward infinity catalyzes the central conflict of the novel. The narrator's summary of this Space Age quest sets the mood for the entire novel: "It flung them like stones. These unhappy agents found what had already been found in abundance on Earth – a nightmare of meaninglessness without end. The bounties of space, of infinite outwardness were three: empty heroics, low comedy, and pointless death" (*ST* 1-2). The emphasis on the endless vacuum of space is explicit. In addition, Vonnegut's opening finds a parallel in Barthelme's experimental novel *Snow White*, where the narrator declares that "each of us is like a tiny little mote of pointlessness, whirling in the midst of a dreadful free even greater pointlessness" (93), so on to infinity.

But Vonnegut's outlook proves more optimistic than Barthelme's because he posits the outward universe as a mirror for the inward one. Thus, the infinity we encounter in Vonnegut's text is markedly different from the traditional concept of infinity largely elucidated by the work of mathematician Georg Cantor: an ever-increasing sequence which cognitive scientists Lakoff and Nuñez dub "The Basic Metaphor of Infinity" (159). Rather than this unbounded infinity studied by Cantor and other set theorists, the infinity of strange time is of a recursive variety. In other words, it describes an infinity contained within a finite set, a characteristic of strange loops.

The infinite strange loops in the text are perhaps best represented in the person of Winston Niles Rumfoord. Rumfoord's infundibulated existence is certainly a strange loop. His materializations lead him from Earth to Titan, indeed to places as distant as Betelgeuse. Regardless of distance, he returns to these points in a sort of orbit. His

materializations are the “punctual” manifestations of his otherwise wave-like existence. And yet, because of his infundibulated vision of all-time, Rumfoord cannot escape his circuit. The spiral path of Titan, itself in orbit around Jupiter (271), mimics Rumfoord's own loop and serves as a visual illustration of his trajectory. Though he knows the details of his path, he is powerless to change it. Moreover, despite being fully aware of the predetermined nature of his actions, Rumfoord cannot change them. Essentially, he is confined to a strange loop.

Rumfoord is not the only character in *The Sirens of Titan* to exist as a strange loop. Indeed, all the characters in the novel exist in a strange loop. As Rumfoord explains to Beatrice:

life for a punctual person is like a roller coaster . . . I can see the whole roller coaster you're on. And sure – I could give you a piece of paper that would tell you about every dip and turn, warn you about every bogeyman that was going to pop out at you in the tunnels. But that wouldn't help you any . . . Because you'd *still* have to take the roller-coaster ride” (54)

Like a roller coaster, time loops upon itself in the scheme of the plot. While this comment is something of a meditation on free will by Rumfoord, it also explicitly refers to the strange time of the plot. The track is closed, and its path is determined. When asked by Beatrice why he does not reveal the details of her future, Rumfoord replies: “”I didn't design the roller coaster, I don't own it, and I don't say who rides and who doesn't. I just know what it's shaped like”” (ibid). Like the “punctual” characters in the text, Rumfoord suffers from the knowledge that he cannot prevent future events. The

temporal architecture of the novel confines the characters to their fates.

The metaphor of architecture is an instructive one. That Vonnegut's father worked as an architect is incidental to the text, but the author does often recourse to detailed descriptions of specific architectural structures in his novels. In *Slaughterhouse-Five*, Vonnegut situates Billy Pilgrim and the former movie-star Montana Wildhack in a geodesic dome during their Tralfamadorian captivity. The geodesic nature of the structure itself certainly suggests the geodesics of Einsteinian geometry.⁵⁵

In fact, two architectural structures in *The Sirens of Titan* symbolize the strange loops of Rumfoord's condition. The first is the Rumfoord mansion itself. When Malachi Constant first encounters this edifice, he notices that “[n]othing about the Rumfoord mansion diminished as it approached heaven” (ST 13). Like a strange loop, the mansion approaches infinity within a finite space. Furthermore, “[t]urned upside down, [the Rumfoord mansion] would have looked exactly the same” (ST 13). This also conforms to the idea of a strange loop. The building itself, in both undiminishing scale and reversible design, is a symbol for the way time is structured in the novel.

The second symbolic structure is the fountain within the Rumfoord mansion. When we first encounter it, we notice that the fountain is a symbol of recursion, spilling into itself without end (13). In its design, the fountain is a strange loop, both cyclical and self-referential. Incidentally, later in the text, the vendor Brackman sells replicas of the self-replicating fountain during the materialization ceremonies at the mansion (238-239). Thus we have a situation where a self-replicating fountain is itself replicated for sale. This interplay of levels further emphasizes the recursive structure of the Rumfoord

mansion.

Significantly, the mansion is an extension of Winston Niles Rumfoord himself. As part of the American aristocracy often criticized in Vonnegut's fiction, Rumfoord demonstrates a symbiotic bond with his possessions. The Rumfoord estate is, in many ways, identified with Rumfoord. As Rumfoord exists in a strange loop, so too does his estate. Vonnegut's use of architecture draws our attention to the cosmic architecture of the universe itself, using everyday artifacts of space to communicate the grand implications of relativity and indeed of the idea of strange time.

Of course, Vonnegut does not neglect the architecture of the mind, itself a reflection of the universe it perceives. Notably, Vonnegut addresses the notion of memory. An interesting example of a strange loop in the text arises when we encounter Constant on Mars after his metamorphosis into Unk, the brainwashed Martian soldier. Through continuous bouts with induced amnesia, Unk manages to devise a system to remember his identity: he leaves himself a letter that explains what the memory-erasing sessions have made him forget. The letter he leaves to himself is another strange loop. As he continues to replicate the letter, Unk continues to end up right where he started. He does not realize he is getting nowhere, does not recognize that he is being manipulated by Rumfoord.

Unk's use of narrative to configure his temporal experience is reminiscent of Ricoeur's approach. Kaplan offers a cogent summary of Ricoeur's idea :

A narrative is like a long memory that orders and repeats sequences of events from beginning to end. With memory comes a retrieval of our past.

For Heidegger, such a retrieval is a repetition of our potentialities of being-in-the-world as inherited from our personal and collective past. We derive our historicity from our temporality. For Ricoeur, the retrieval of one's destiny and fate occurs only in the repetition of action in a narrative . . . meaningful only as human time, when it becomes refashioned and turned into the kind of public, social thing that can be understood when expressed in a fictional or historical narrative (54)

Unk's self-referential letters are his attempt to configure an otherwise disjointed temporal experience into something cohesive and linear. In other words, he must use narrative to make sense of the disjointed circumstances of his temporal life. Since "Unk had written the letter to himself before having his memory cleaned out" (*ST* 132), the letter contains the entire catalog of knowledge amassed by Unk before his numerous memory cleanses. Only Rumfoord is able to fully explicate the events that succeed Constant's loss of memory. Ironically, he begins his recap of Unk's origin with "Once upon a time" (160), an introductory remark that emphasizes both his patronizing tone and his tendency to construct reality around myths or fables. This aspect of Rumfoord's project in the novel centers around the creation of myths, or in Vonnegutian terms, *foma*.^{xiv} Rumfoord's project coincides in many ways with Vonnegut's own, namely the need to present scientific ideas in the forms of myths, to reintroduce the role of the shaman to a post-scientific, post-theistic society.

Vonnegut continues this project in *Slaughterhouse-Five*. Like *The Sirens of Titan*, this text also represents time as a strange loop. As Klinkowitz notes, *Slaughterhouse-*

xiv "Harmless untruths" as defined in the epigraph of *Cat's Cradle*

Five “creates a radical reconnection of the historical and the imaginary, the realistic and the fantastic, the sequential and the simultaneous, the author and the text” (*Kurt Vonnegut* 69), and it is this reconnection that often results in strange loops. From the novel's outset, readers encounter examples of this phenomenon. The first example we encounter is the endlessly repeating Yon Yonson song which recursively loops back into itself like Barth's “Frame-Tale.” The song is a relevant parallel to the temporal structure of the novel itself:

My name is Yon Yonson,
I work in Wisconsin,
I work in a lumbermill there.
The people I meet when I walk down the street,
They say, “What's your name?”
And I say,
“My name is Yon Yonson,
I work in Wisconsin . . . (*SHF* 3)

The endlessly repeating loop of the Yon Yonson song is a clear example of a strange loop. The text of the novel operates in a similar fashion, since the events are structured to endlessly repeat themselves within the confines of their block universe. The repetition of other elements throughout *Slaughterhouse-Five* is likewise a deliberate stylistic device that allows Vonnegut to develop his metaphor. The most noteworthy of these repetitions is the much addressed comment “So it goes” that peppers the text. Edelstein has referred to this repetition as a “leit-motif” in the novel, and this comparison invites us to consider

the text as something of an Endlessly Rising Canon.⁵⁶ We also encounter nested structures of quotations in quotations which, like the endlessly repeating Yon Yonson song, exhibit strange loop qualities. Temporally, we as readers proceed through the novel only to remain, like Carroll's Red Queen, running in place without actually getting anywhere.

Billy's existing "unstuck in time," an analog of Rumfoord's own dilemma, likewise manifests this strange loop time structure. He moves around the strange loop of his life, being born, dying, and, of course, gravitating back to the center of his experience, the terror of Dresden. Billy cannot escape the traumas of his life, largely due to their temporal ever-presence. His existence, like Rumfoord's, is therefore infinite. As Paul Davies remarks, Pilgrim's "immortality [is] restricted to a fixed set of events" (41). As a strange loop, Billy's life contains an infinity of events within a finite set of ever-present moments. He must continuously re-experience these moments. The situation places him firmly in a loop:

Billy Pilgrim has come unstuck in time.

Billy has gone to sleep a senile widower and awakened on his wedding day. He has walked through a door in 1955 to come out another one in 1941. He has gone back through that door to find himself in 1963. He has seen his birth and death many times, he says, and pays random visits to all the events in between (23)

Importantly, no matter how many jaunts Billy takes through his life, he inevitably arrives right back where he started. He cannot escape the recursive flux of his consciousness

through the static moments of his life.

In some sense, Billy is a Heideggerian “das Man,” which Carr defines as “the impersonal and anonymous everyone-and-no-one in which each individual is interchangeable with every other” (82). Vonnegut's democratic perspective construes Billy as the everyman. Not unlike the ubiquitous Everyman in Medieval morality plays or, even more explicitly, Christian in Bunyan's *Pilgrim's Progress*,⁵⁷ Billy represents the underlying experience of human existence. His strange loop of life events represents the tangled hierarchy of strange time which confounds ordinary human consciousness. Vonnegut's attempt to popularize this perspective forms a foundation for his entire project as an artist. As Klinkowitz remarks, through his fiction Vonnegut adopts “a perspective that takes the most sophisticated notions of twentieth-century science and philosophy but reshapes them in the familiar terms of bourgeois life” (*Kurt Vonnegut* 20). Einstein shared this same concern of communicating his ideas to the masses.

While difficult to portray within the limits of linear narrative, Vonnegut best achieves the effect of a strange loop in the third chapter of *Slaughterhouse-Five*. As John Somer notes, a reader may begin anywhere in the chapter (229). The order of events is haphazard and scattered through space-time. More than at any other moment in the text, “Billy is spastic in time” (23) throughout the chapter. One minute he is a German POW, the next he is performing an eye exam later in life as an optometrist (55-56). Just as he accustoms himself to his new surroundings, “he was back in World War Two again” (58). As he explains, “he was simultaneously on foot in Germany in 1944 and riding his Cadillac in 1967” (*ibid.*). Billy is cycling through the events in his life with “no control

over where he is going next” (23). Like Rumfoord, Billy cannot escape the circuit of his temporal strange loop.

We must briefly note the bidirectionality of Billy's travels. He moves erratically through time, neither exclusively backward or forward. As we saw from Gödel's corollary to Einsteinian relativity, travel in either direction is plausible. A vital aspect of relativity is that it “all phenomena it describes are reversible” (Coveney 80). Therefore, we encounter a sort of asymmetry. Physicist Roger Penrose notably comments on the problems of such asymmetries: “The main problem is that on the microscopic level, the laws of physics are all symmetric with respect to time, yet time asymmetry is manifest on the macroscopic scale” (qtd. in Coveney 81). A similar bidirectionality occurs when considering quantum theory. Hofstadter notes that many strange loops are bidirectional, although this is certainly not a criterion of their definition. Rather, it is a coincidence of their design.

A similar insistence on bidirectionality occurs in *The Sirens of Titan*. At the ceremony where Rumfoord reveals to the crowds that the Space Wanderer is in fact Malachi Constant, the object of their collective disgust as a symbol of hedonism and decadence, Rumfoord explains to Constant that the crowd would “like it just as much the other way around, you know . . . It's the contrast they like. The order of events doesn't make any difference to them. It's the thrill of the fast reverse” (251-252). In some sense, the crowd could very well symbolize the readers.⁵⁸ The fortunes of Constant are tragic simply because of their extreme polarity, not because of a fall or a rise. These events are like stripes on a barber pole, proceeding upward or downward to the same effect, always

eliciting the same result. This emphasis on the triviality of event order mimics Vonnegut's deconstruction of cause-and-effect as a consequence of strange time.

Ultimately, one must ask if these texts themselves can be viably termed strange loops in every respect. Indeed, in a strange loop, there need be no point of embarkation; any starting point should suffice. At first glance, this criterion undermines the possibility that Vonnegut's time-travel novels are strange loops. For the texts to achieve their optimum effects, the sequences of events *do* matter. While juxtapositions serve a crucial function in Vonnegut's fiction, he cannot escape from the necessary formulations of cause and effect. There is still, despite Vonnegut's experimental plot structure, a beginning, middle, and end. The readers' foreknowledge of the end and the terminal explanations of the beginning bend this traditional sequence, but they do not abolish or eliminate it completely.

An empirical thought experiment illustrates this hypothesis. Randomly selecting starting points in the text, would the reader extract the same narrative? To some extent, they would. Both *The Sirens of Titan* and *Slaughterhouse-Five* could function with altered order. As I proposed earlier in this chapter, Chapter Three of *Slaughterhouse-Five* could easily and effectively function with a different order of events. But we must consider that not all portions of the text could survive such an experimental reconfiguration of event-order. At some point in such a rearrangement, they would lose both their efficacy and perhaps even their meaning. We must also exercise caution and resist the temptation to generalize the strange loop aspects of Vonnegut's fiction to every element of that fiction.

Nevertheless, the books as artifacts might viably serve as examples of simultaneous strange loops. In the previous chapter, we discussed the possibility that books might represent block universes; the same possibility exists with strange loops. Only the application of linear human consciousness (à la the reader) imposes a linearity or “punctuality“ to the flow of the narrative. Stylistic devices can alter the perception of this flow. One could argue that the perceived passage of time in the novels directly correlates with the length of time taken to read them. By this hypothesis, shorter sentence structures would affect the reader's perception of elapsed time. Vonnegut’s telegraphic, punctuated prose style often achieves the effect of playing with time in this manner. He even goes as far as to alter chapter length, producing a similar effect. Furthermore, each individual’s perception of time affects the flux. Thus, even the reader exists in a subjective time, relative to everything else. While certainly a metafictional extreme, the possibility exists.

Another intriguing metafictional situation arises here. If a reader has already read the text, it becomes feasible to begin anywhere and form a lexical strange loop. At its extreme, this argument suggests that all texts might exist as strange loops, creating self-referential universes that do indeed create themselves in their symbiotic relationship with the reader. This supposes a sort of hermeneutic system. Unfortunately, such a drastic proposal neglects the semantic reliance of the text upon external systems of signification. As no text exists in a vacuum, no text is ultimately a strange loop. A proximate identification, however, is apparently tenable and worth consideration as a viable theoretical possibility. Hofstadter certainly asserts that strange loops represent a “crux”

for understanding consciousness (*GEB* 709). Metastable moments in the text might parallel the metastability of conscious perception. Just as metafictional elements produce a self-referential system within the text, the phenomenon of self-awareness in thought produces a similar strange loop network. Likewise, the temporal structure I have explored exists in a similar self-referential strange loop.

Vonnegut's presentation of strange time in this context is “autocatalytic” (Coveney 86). This term reminds us immediately of the work of Alan Turing, who postulated self-aware machines. Cognitive psychology has recently begun using Turing machines as models for the human mind/brain. Indeed, humans in Vonnegut's fictions function like self-aware machines. Often their behavior implies that they are automatons. This possibility necessarily leads us to a consideration of free will in the novels. Autocatalysis serves as an excellent metaphor for both strange loops and Vonnegut's novels, but such a concept poses some perplexing issues when we consider the notion of free will.

CHAPTER FOUR

“ONLY ON EARTH”: VONNEGUT AND FREE WILL

In one of his many philosophical conversations with the Tralfamadorians in *Slaughterhouse-Five*, Billy Pilgrim wonders about the effects of the extraterrestrials' simultaneous, block-universe perspective on free will:

“You sound to me as though you don't believe in free will,” said Billy Pilgrim.

“If I hadn't spent so much time studying Earthlings,” said the Tralfamadorian, “I wouldn't have any idea what was meant by 'free will.' I've visited thirty-one inhabited planets in the universe, and I have studied reports on one hundred more. Only on Earth is there any talk of free will”

(86)

To Billy, as to many of us, the conclusions of relativity seem to preclude any notion of free will as we understand it. Given Vonnegut's use of block universes and strange loops in his texts, one must consider the ramifications of the resultant strange time on free will as well. Free will has been much discussed by Vonnegut critics, but until now no one has investigated Vonnegut's position on the matter as a result of his scientific positions.

Vonnegut's texts beg important questions. If the future events in a block universe already exist, do our actions and choices have any real consequences? Is our perception of

causality merely a symptom of our “punctual” existence? And lastly, does determinism actually undermine our ethical systems?

Popper and others note the determinism implicit in Einstein's theories. According to Popper: “Einstein was a strict determinist when I first visited him in 1950: he believed in a 4-dimensional Block Universe. But he gave this up” (qtd. in Marcus et al. 176). Though his opinions later changed, Einstein espoused a species of determinism in the wake of his revolutionary theories. Bertrand Russell likewise comments on the determinism implied by Einsteinian relativity.⁵⁹

Here I must distinguish determinism from the closely allied idea of fatalism. Loosely defined, these two positions are nearly equivalent and are often used interchangeably. However, fatalism is “the view that we are powerless to do anything other than what we actually do” (“Fatalism”), itself a consequence of determinism. Thus fatalism is a type of determinism by this definition. A distinction between two species of determinism, Laplacian determinism and fatalism, is necessary here. Laplacian determinism proposes that conditions of the present combined with physical laws allow us to determine all past and future events. Fatalism suggests that future laws are fixed but may or may not adopt Laplacian deterministic ideas, which are themselves incompatible with quantum theory as we now understand it. Fatalism coincides with the idea of an Einsteinian block universe, and therefore that is the term I shall apply to the Tralfamadorian position on free will.⁶⁰

The ramifications of relativity on free will certainly shook the foundations of philosophy. The most notable philosopher of time to confront Einstein's theory was the

French philosopher Henri Bergson. Bergson's early work *Time and Free Will* offers a variety of ideas about time, some of which contradict Einstein's and some of which complement them. Bergsonian "pure duration" in some ways complements the Minkowskian block universe proposed by Einstein. But the vast majority of ideas expounded in Bergson's early philosophy do not agree with the dicta of relativity. In fact, after a meeting between Einstein and Bergson at the College de France in 1922, the physicist admitted that "there was an unbridgeable gap between the time of the physicist and the time of the philosopher" (Ansell-Pearson and Mullarkey 26). This gap echoes the mutual incomprehension feared by C.P. Snow.

Philip M. Rubens suggests that Vonnegut adopts Bergsonian *pure duration* as the basis for Billy Pilgrim's "spasticity" as well as for Rumfoord's infundibulated perspective. Certainly, Billy "ricochets in time" in Bergson's terms, something Rubens notes (5). Likewise, Billy's acknowledgment of static time agrees with several of Bergson's ideas about duration. For Bergson, "duration and motion are mental syntheses, and not objects; that, although the moving body occupies, one after the other, points on a line, motion itself has nothing to do with a line" (120). This denial of temporal linearity perfectly accords with Einstein and, subsequently, with Vonnegut. We might even consider it a species of Kantian idealism.

However, despite Rubens's argument, much of what Vonnegut presents in these texts contrasts the suppositions of Bergson. While Rumfoord and Pilgrim do perceive events that are separated by space and time, their perceptions are more in keeping with a relativistic universe than with a Bergsonian one. In *Time and Free Will*, Bergson makes a

valid point when he cautions his readers not to confuse time as an abstract idea with *duration*. As he explains, “[w]e are simply confronted with a confusion between concrete duration and abstract time, two very different things” (155). Bergson famously notes that time is neither real homogeneous medium or a mental construct but rather something possessing duration. Duration is not a measured quantity:

“[f]or if time, as the reflective consciousness represents it, is a medium in which our conscious states form a discrete series so as to admit of being counted, and if on the other hand our conception of number ends in spreading out in space everything which can be directly counted, it is to be presumed that time, understood in the sense of a medium in which we make distinctions and count, is nothing but space” (Bergson 91).

As evident in this statement, the proposals of Einstein plague Bergson's early writings. He repeatedly asks, “Is time space?” (181, 190), a rhetorical question that loses its salience in light of relativity.

As an answer to Bergson's question about the identification of time with space, the elaboration of Einsteinian relativity using Minkowskian space-time delivers a resounding “Yes.” Bergson explicitly denies the idea of Gödelian closed timelike curves as well, since for him “time is not a line along which one can pass again” (181). Identifying Vonnegut too closely with Bergson denies the fact that Vonnegut espouses the tenets of Minkowskian and Gödelian space-time in his fiction. Bergson emphasizes the perceived threat to free will when he claims that “[i]n whatever way, in a word, freedom is viewed, it cannot be denied except on condition of identifying time with space” (230).

Again, Minkowskian spacetime does just that. Thus, by Bergson's definition, freedom can be denied only if we accept the notion of space-time. Vonnegut's texts do adopt this position and consequently deny freedom by virtue of Bergson's definition. Billy Pilgrim does not act of his own accord, and throughout the novel he is a victim of circumstance. Likewise, Malachi Constant is manipulated through various episodes. Everyone in both novels is re-enacting a play that has already happened, that is still happening, and that will continue to happen. Rumfoord explains this clearly in the deathbed speech we discussed in Chapter Two.

Like Einstein, Hofstadter notes the consequences of strange loops on free will within certain systems. The clearest textual example of a strange loop that compromises free will is Rumfoord's "puppeteering" throughout *The Sirens of Titan*. The mind-control exercised over the Army of Mars is itself symbolic of the fatalism that permeates the novel. Similarly, the antennae implanted into the soldiers' brains parodies the idea of fatalism, albeit with the actual possibility of universal fatalism hovering in the background. No one in the novel is fully in control of their actions, not even Rumfoord. Despite his machinations, Rumfoord reveals that he too is but an agent of another force. As Peter Reed observes, "[t]he puppeteer [Rumfoord] is himself a puppet" (71). This statement resembles the words of Dr. Manhattan in Alan Moore's *Watchmen*, who states that "We are all puppets . . . I'm just the puppet who can see the strings" (5). In both instances, the puppetmaster and puppets are tangled up, rendering the distinction between these levels obsolete.

The fatalism that dictates Rumfoord's actions is suspected by Salo, the

Tralfamadorian messenger stranded on Titan. Observing Rumfoord's actions, "Salo had had an uneasy suspicion from time to time that Rumfoord was under the influence of Tralfamadore, but he'd pushed the thought out of his mind, since there was nothing he could do about it" (289). Even Salo, a Tralfamadorian himself, is powerless to change the events that unfold. Rumfoord later confesses that "'Tralfamadore . . . reached into the Solar System, picked me up, and used me like a handy-dandy potato peeler!'" (290). Aware of his fatalistic universe, Rumfoord nevertheless expresses his displeasure at this very awareness.

The tangled hierarchy is complicated even more by the fact that "[Salo] was a machine, like all Tralfamadorians" (ST 279). The beings influencing the events of human history in the novel, including the manipulations of Rumfoord, are themselves machines! The chain of command therefore includes yet another level, which likely contains another, *ad infinitum*. Furthermore, the description of the creators of the Tralfamadorians (279-280) paints a picture of a civilization ironically similar to earthling civilization. This only heightens to recursion of the system since the beings that created the Tralfamadorian machines (who control the events on Earth) are themselves human-like. This chain resonates with a comment made by Rumfoord, who states that ". . . [Malachi] was not only a victim of outrageous fortune, but one of outrageous fortune's cruelest agents as well" (163).

The suggestions of fatalism in both novels do not sit well with the characters themselves. Even the quasi-omniscient Rumfoord resists the actuality of determinism, saying to Salo, "'It may surprise you to learn that I take a certain pride, no matter how

foolishly mistaken that pride may be, in making my own decisions for my own reasons”” (ST 290). Rumfoord's disgust with the idea that the universe is predetermined forces him to repudiate his only friend in the book, the Tralfamadorian Salo. Rumfoord's calling Salo a “machine” as an insult is ironic since automated, sphexish^{xv} behavior is common to both humans and machines in both novels. Despite his knowledge of “the monotonous clockwork of the Solar system” (292), Rumfoord still believes in the efficacy of individual action.

Vonnegut repeatedly uses the metaphor of humans as machines throughout his oeuvre. As Billy Pilgrim notes in *Slaughterhouse-Five*, “Tralfamadorians, of course, say that every creature and plant in the Universe is a machine. It amuses them that so many Earthlings are offended by the idea of being machines” (154). In *Breakfast of Champions*, Vonnegut makes the similar observation “. . . that human beings are robots, are machines” (3). These comments imply the fatalism that Vonnegut's texts so frequently espouse.

Many critics caution against identifying the fatalism of the Tralfamadorians with an authorial endorsement of fatalism, but the recurrence of this theme suggests that Vonnegut at least considers this type of universe a likely possibility. Even Bergson is not free of the idea that humans sometimes behave like automatons. While Bergson denies that humans are entirely machines, he admits that in certain circumstances that we behave as “conscious automaton[s]” (168). Vonnegut insinuates that he believes more strongly than Bergson in the role of human beings as a type of machine. Schatt notes that *The Sirens of Titan* implies “the possibility that man is merely a machine whose destiny

xv A term coined by Hofstadter denoting mindless, repetitive behavior.

is already controlled by other machines” (30), another instance where Vonnegut diverges from Bergson.

But Vonnegut does not typecast his characters as only mere machines. As Reed notes, “Rumfoord's vision of a universe in which the future is fixed proves unpopular with all the major characters. Vonnegut seems to confirm the obvious truth that while people often want to know the future – as if assuming the future already laid out – they find the notion of being unable to change what they do not like repugnant” (68). The trials of Constant combine into an account of his struggles against the machinations of Rumfoord and Tralfamadore. Indeed, “the struggles of Beatrice and Constant to contend with Rumfoord's prophecies and with being used or controlled represent two versions of living with a known future and an absence of free will” (71), an observation that refuses to define the characters in the text as purely mechanical.

While Bergson denies “that the psychic fact is fatally determined by the molecular movement” (148), he is not privy to recent advances and the strong likelihood that psychological systems are one peculiar type of physical system, bound by the same parameters as waterfalls, redwoods, and Red Giants. Indeed, Constant's role as Rumfoord's puppet seems to reinforce the idea that humans exist as automatons in a fatalistic universe, but as I argued earlier, the resistance of the characters distinguishes them from automatons who cannot contemplate the purpose or significance of their actions. Still, Vonnegut's universe in *The Sirens of Titan* functions like a cosmic clock, with each cog's movements intricately responsible for the movement of other cogs which, in turn, are responsible for repeating the process. A similar metaphor is appropriate for

Slaughterhouse-Five, where the actions of Billy's life are intricately interwoven like the tapestry plots of Tralfamadorian novels, or the temporal structure such novels strive to represent.

In our discussion of free will in the texts, there is another theory of physics that we must consider: quantum theory. Hofstadter notes the strange loop qualities of quantum theory, but our treatment of quantum theory concerns its role as a symbolic discourse representing randomness or chance. This idea seems intrinsically contrary to fatalism, but several critics have noted that the erratic nature of Pilgrim's time trips suggests the chaotic quality of Heisenberg's quantum mechanics. As Sigman posits, “[w]hen the systematic weaving of uncertainties into the fabric of *Sirens* is considered in relation to the theme of chance and accident that is also prominent in the book, it begins to seem quite likely that the scientific world-view of the book includes quantum theory as well as relativity” (31). Interestingly, as Hawking and others note,⁶¹ quantum mechanics and relativity do not agree on many points. In fact, the grand unified theory that has become the central project of contemporary physics seeks to rectify this asymmetry.

Vonnegut's layout in *Slaughterhouse-Five* takes both relativity and quantum theory into account. Like Billy Pilgrim's erratic jumps in time, quantum theory's “Schrodinger's equation . . . is both deterministic and reversible in relation to time” (Coveney 80). Likewise, the chaotic journey of Malachi Constant seems to follow the unpredictability espoused by Heisenberg, as Sigman suggests.⁶² Other events also indicate the role of randomness or unpredictability in the texts. The first involves Noel Constant,⁶³ Malachi's father, who generates the family fortune by randomly choosing

stocks using the letters of the Bible. This random act unintentionally produces fantastic results, a meditation by Vonnegut on the emergence of order from chaotic systems.

Another example is the credo of Constant during the Space Wanderer episode. When questioned by the crowd about his journey, Unk in a Messianic moment replies: “I was a victim of a series of accidents . . . [a]s are we all” (232). This emphasis on chaos underlies much of the novel's structure.

Yet the seeming unpredictability of even the most absurd events in the novel are undermined by Rumfoord's precognition. Lundquist rightly notes that Vonnegut is likely playing with both theories. On the large scale, Vonnegut's universe conforms to Einsteinian relativity and therefore suggests a fatalistic universe. On a smaller scale, namely on the level of the characters themselves, Vonnegut implies that human beings react to their situations unpredictably, and that the meaning that they create in an existential manner is not subject to the determinism of the cosmos. Thus Vonnegut has created a scenario where chaos and order are not mutually exclusive. In light of recent findings in chaos theory and fractal mathematics, much of the chaos in the universe in fact follows simple, recursive rules. Expanding on this paradigm, Boon identifies Chaos Theory⁶⁴ as “a fresh theoretical frame which explains how both [free will and determinism] can exist without the apparent contradiction” (28).

Sigman has also explored the role of quantum physics in *The Sirens of Titan* and one could argue that Heisenberg's Uncertainty Principle⁶⁵ penetrates much of Vonnegut's fiction. The Copenhagen interpretation of quantum theory implies that, as in Vonnegut's fiction, “fate and accident are simply a part of the natural order” (Mayo 19). Indeed,

Slaughterhouse-Five may propose a block universe or a Gödelian system, but the randomness inherent in Billy Pilgrim's leaps through time suggest a certain degree of unpredictable chance. Furthermore, the style of Vonnegut's prose supports this likelihood. Segments of text are seemingly randomly juxtaposed. The overall effect is a chaotic but strangely cohesive narrative, one that implies both the fatalism of relativity and the uncertainty of quantum physics.

The duality of these two ideas is symbolized by various characters. Winston Niles Rumfoord, able to see time in a block universe and existing in a strange loop, certainly represents the tenets of Einsteinian relativity and Gödel's corollary. On the other hand, Malachi Constant and Beatrice represent the quantum universe and its chaotic effects, even though they too fit within the grander narrative of relativity. Billy Pilgrim serves as a reconciliation of both theories, the logical literary descendant of both Constant and Rumfoord, possessed with the former's chaotic movements and the latter's profound temporal vision. Certainly Billy's profession as an optometrist represents his ability to see many perspectives. Taken together, these characters symbolize all the nuances of Vonnegut's temporal scheme.

Schatt observes that “[s]ince Vonnegut's novels usually are constructed around two diametrically opposed points of view, it is not surprising that *Slaughterhouse-Five* is built around the irreconcilable conflict between free will and determinism” (91). However, these antipodes are reconciled in the texts because, while events may unfold according to the mechanistic laws of the physical universe, the subjective reaction to these events is not determined. Contrary to Schatt's position, Vonnegut's texts are too

multifaceted to be considered as binary constructs. Far from remaining distinct in the novel, these binaries are largely resolved by the characters. Constant and Beatrice both realize this. They accept their fate on Titan, they accept the simultaneous block universe that causes their fatalistic dilemma, but they embrace it and learn to love. These human elements, distinctly subjective and free of control from any outside source in the novel (even free of the Tralfamadorians) are central to the novel. While the strange loop of time persists, the subjective response to events is uniquely the property of free will. Therein lies Vonnegut's reconciliation.

Another inherent problem in Vonnegut's universe is the apparent lack of purpose or goals. In my discussion of block universes, I emphasized the anti-teleological nature of this type of universe. Indeed, the Sirens of Titan themselves, presented as a sort of grail to Malachi, are in fact just statues sculpted from Titanic peat from Salo. This irony reflects the lack of a cosmic grail in Vonnegut's universe. Just as evolution by natural selection (a theme treated at length in Vonnegut's *Galapagos*) proceeds regardless of goals, so too does Vonnegutian strange time. We must be careful not to assume that without a telos Tralfamadorian simultaneity inevitably deprives the universe of free will, consequences, and perhaps even meaning. Time behaving as a strange loop does not *necessarily* imply fatalism. If events unfold simultaneously, the conscious will still perceives and acts in keeping with the cause-effect parameters of linear time. No agent of action decides because it knows how it must choose or because he is made to choose. In that instance of choice, it decides fully unaware (beyond its own precognitive or expectational considerations of its choices' ramifications) of the outcome. The event

unfolds as part of a matrix of simultaneous yet connected “event-nodes,” and this does not alter the circumstances of the decision. In short, strange time does not deflate free will. Indeed, it complements the crucial role of the mind in generating meaning.

If we consider the Tralfamadorian time view only as a satirized form of fatalism, then the only bright spot in *Slaughterhouse-Five* – the hope of immortality within mortal life – must be read as a farce. I find this unlikely and disagree with the many critics who outright reject Tralfamadorian “fatalism” as a meaningless, pessimistic worldview. Joseph C. Schopp states that “Tralfamadore . . . by abolishing time, abolishes hope and change, development and free will” (qtd in Morse, *Kurt Vonnegut* 89). I must emphatically disagree with this proposal. Contrary to accusations of pessimism, this view is necessarily optimistic and privileges memory as access to a real historical past, an actual reality rather than a Ricouerian *trace*. All moments in life are made more significant in a scheme where they exist eternally. Tralfamadorian fatalism offers a unique perspective with its foundations in a variety of philosophical systems.

The dilemma of free will in Vonnegut's texts deserves a more thorough treatment than the one I can present here.⁶⁶ However, the effects of strange time on free will must be examined if we are to come to a fuller understanding of both the phenomenon and its consequences. These considerations must not be confused for theories about the actual physical world. Rather, they are intended to explore the possibility that Vonnegut's texts are philosophical experiments concerned with the union of the discoveries of physical science with the theories of philosophy. Only by a synthesis of diverse disciplines can we hope to achieve a firm understanding of the world and its complexities. Vonnegut

strives for this fusion throughout his oeuvre, and in doing so brings us closer to a Third Culture that will overcome many of the most serious theoretical obstacles facing postmodernity.

All of the considerations that I have made must be taken with this in mind. I am not necessarily suggesting that strange time is the only way we can accurately configure the phenomenology of time. There are a variety of ontological questions that must be answered before we can definitively answer the more profound questions about the nature of time. However, strange time in Vonnegut's narratives exhibits qualities consistent with a variety of consequences of Einsteinian relativity, from block universes to strange loops. Yet, Klinkowitz warns us that “[r]eminding the reader that fictions are provisional realities and not bedrock truth is the essence of Vonnegut's work: his one enduring theme and the metafictional center for each of his novels” (*Kurt Vonnegut* 17). We must not confuse the extrapolations of fiction for ultimate truths. Indeed, taking novels too seriously is “the stuff of great mischief” and “Once the stuff of religions or novels becomes the one and only truth, their art evaporates, leaving us with content alone . . .” (18). Klinkowitz's observations are crucial in considering the ramifications of my argument. Like empirical experiments, Vonnegut's fictions are intended to test possibilities rather than declare certitudes.⁶⁷

As Morse notes of Bunyan's *Pilgrim's Progress*, “the nature and goal of any quest becomes apparent not in the beginning, but only during the journey, and then mostly at the end” (Morse *Kurt Vonnegut* 37). Only when we view the texts in their totality, just as Rumfoord or Pilgrim or the Tralfamadorians view time, can we consider the magnitude

of the ideas presented therein. In discussing Vonnegut's fictions, we must remember the role of texts as tools for formulating valid and generalizable theories about the world, in concert with the findings of empirical science. As Gödel claims, "Only fables . . . present the world as it should be and as if it had meaning" (qtd. in Yourgrau 5), and it is fables like Vonnegut's that bring us to a firmer understanding of the power of narrative to elucidate complex philosophical concepts. In considering the phenomenology of strange time, we must remember that "[i]t is one thing to claim that narrative discourse clarifies, organizes, and configures the temporal and historical dimensions of human experience into meaningful episodes; it is another to claim that there is no difference between a true story and an imagined one" (Kaplan 54). Yet the possible worlds which Vonnegut explores serve as valuable lenses through which we can view the possibilities of scientific discourse, and through these meditations explore the nuances of empirical discoveries.

The physical universe described by physical science needs such fictions to provide a human element to otherwise sterile postulates. While Vonnegut certainly suggests that the universe is mechanistic and meaningless, he does not attribute any inherent negativity to this claim. In fact, for Vonnegut "the physical universe is neither merciful nor cruel, just or unjust. It simply is" (Mayo 17). But it is populated by characters who serve as proverbial guinea pigs. Without linear time and the concomitant idea of cause-and-effect, these characters successfully acquire meaning in an existential mode.

In *The Sirens of Titan*, each character imbues his or her individual experience

with meaning appropriate to personal philosophy. Beatrice summarizes hers quite succinctly in *The True Purpose of Life in the Solar System*: “those persons who have served the interests of Tralfamadore have served them in such highly personalized ways that Tralfamadore can be said to have had practically nothing to do with the case” (315). Constant also develops a final meditation on the meaning of life when he states “the purpose of human life, no matter who is controlling it, is to love whoever is around to be loved” (320). Both of these realizations agree with Bergson's assertion that “[f]reedom is the relation of the concrete self to the act which it performs” (219). Like his parents, Chrono posits the most shamanistic meaning, finding his peace with the birds of Titan. His existence is ritualistic, recalling Eliade's Eternal Return or even aboriginal Dreamtime. It is Rumfoord alone among the main characters of the text who does not express a succinct meaning of life. His reticence suggests that his perspective is the most objective and therefore the most aligned with physical existence rather than with an existential project to formulate meaning in an absurd universe. Perhaps his inability to do so is also a remark on the inability of science to completely satisfy our need for meaning in an otherwise meaningless universe.

We must also recognize the satiric elements of Vonnegut's fiction. In many ways, he employs what Lundquist calls “cosmic irony,” namely “the laughable prospect of man's attempts to give order to the disorder of the universe through philosophies, theologies, or even scientific systems” (18), to infuse his fiction with a levity in the face of absurdity. This view calls on us to avoid taking Vonnegut's suggestions too seriously. Of course, we can use the texts as a springboard for thought experiments, but we must be

careful not to fall into the logical traps that catch so many critics, namely confusing the truths of the text for the truths of objective reality. Oftentimes these truths coincide, but just as often they are mutually exclusive.

Klinkowitz reiterates that “[i]f made too much like real life, novels can be mistaken for messages; we need to be reminded they are metaphors” (*Kurt Vonnegut* 73). This caveat reminds us of a similar one from Ricoeur, who cautions that “the recourse to the theory of tropes runs the risk of erasing the dividing line between fiction and history” (*Reality* 33). Both suggestions must be considered in evaluating my argument.

But there is one truth that these texts certainly posit: that the universe can be better understood through the integration of disciplines. Through Vonnegut's literary calculus, we as readers encounter scientific ideas alongside those of philosophy and literary theory. Significantly, we are forced to engage these ideas and wrestle with their validity. From this perspective, experiments with fiction become valid, indeed necessary, tools for exploring the facts of science, sometimes in ways that empirical science cannot. Only through such an interaction of physical science and philosophy, literary theory and social science, can we come closer to the formation of the Third Culture that Vonnegut heralds.

NOTES FOR CHAPTER ONE

¹ The term “Science Wars” refers primarily to the so-called Sokal Affair, the publication of Alan Sokal's paper “Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity” in the *Science Wars* issue of the journal *Social Text*. A follow-up article by Sokal in *Lingua Franca* (“A Physicist Experiments with Cultural Studies”) revealed the paper to be a hoax, intended to expose the ignorance of science rampant among postmodernist theorists and reviewers. The affair emphasizes the rift existing between the sciences and humanities, a rift which Snow foresaw as a major hurdle to serious intellectual progress. For a fuller perspective of this controversy, see Jay A. Labinger and Harry Collins's *The One Culture?: A Conversation About Science* or Alan Sokal and Jean Bricmont's *Fashionable Nonsense: Postmodern Intellectuals' Abuse of Science*.

² Notably Elinor Shaffer in *The Third Culture: Literature and Science* and David L. Wilson and Zack Bowen in *Science and Literature: Bridging the Two Cultures*. For a diverse collection of essays on the topic of reconciling the two cultures in the science fiction genre, see *Science Fiction and the Two Cultures: Essays on Bridging the Gap Between the Sciences and Humanities*.

John Brockman's book *The Third Culture: Beyond the Scientific Revolution* adopts a very different definition of the term and distorts Snow's original meaning almost beyond recognition. For Brockman, the Third Culture “consists of those scientists and other thinkers in the empirical world who, through their work and expository writing, are taking the place of the traditional intellectual in rendering visible the deeper meanings of our lives, redefining who and what we are” (17). However, Brockman limits his definition to scientists and fails to include non-scientific thinkers, whose ideas are equally important in constructing a broad theory of the universe and man's place within it. According to Brockman, “[l]iterary intellectuals are not communicating with scientists. Scientists are communicating directly with the general public” (18). Despite his claim, works like Wilson and Bowen's testify that literary intellectuals are indeed communicating with members of the scientific community. In his work, Brockman includes Steven Jay Gould, Richard Dawkins, Steven Pinker, Daniel C. Dennett, Roger Penrose, and others as representative figures in his “third culture.” While several of these thinkers have made serious strides toward the formation of an actual third culture (per Snow's definition, not Brockman's), the omission of non-scientists from a book claiming to discuss the third culture provides further evidence that the rift between disciplines is still unacceptably wide.

Several Vonnegut critics have noted his relationship with science, a fact that places him firmly within Snow's third culture. Daniel Cordle even draws extensive

parallels between Vonnegut and biologist (and popular science author) Steven Jay Gould, especially with respect to Vonnegut's treatment of evolution by natural selection in *Galapagos*.

³ For a personal account of this scientific background, see Vonnegut's nonfictional *Wampeters, Foma, and Granfaloons* or the introduction to *Slapstick*, both of which discuss his background in the sciences and his relationship with his brother Bernard, an academic chemist. For a thorough account of Vonnegut's life, see Klinkowitz's article "Vonnegut in America."

⁴ In fact, *Player Piano*, Vonnegut's first novel, is largely derived from his experiences at General Electric. Vonnegut's precise, sparse prose is also reminiscent of the technical writing he practiced during his time with GE.

⁵ Initially, science fiction became a manifestation of the counterculture. The establishment against which this movement stood embraced science as one of its fundamental tenets. As Lundquist notes, "The birth of this subculture [Sci-Fi] anticipated much of what happened during the 1960s when devotees congregated around gurus or rock musicians or even such writers as Robert A. Heinlein and Vonnegut himself, both of whose work seemed to embody the most appealing of all science fiction characteristics, the mating of magic and science" (89).

⁶ The following treatments of nonlinear structures in postmodern novels are helpful: Charles B. Harris's *Contemporary American Novelists of the Absurd*; Raymond M. Olderman's *Beyond the Waste Land: The American Novel in the Nineteen Sixties*; and Sharon Spencer's *Space, Time, and Structure in the Modern Novel*. For an elucidative review of the three with copious Vonnegut references and corrections, see Klinkowitz's review "Not By Theme Alone."

⁷ Notably Sigman, Burgass, and Rubens whose opinions on the subject are discussed in Chapters Two and Three.

⁸ While Karon's comment is directed toward Vonnegut's short fiction, it is equally valid regarding his novels. The majority of Vonnegut critics tend to cursorily treat his temporal theory, or else write it off as parody. Yet time's prevalence as a theme in Vonnegut's oeuvre suggests it occupies a central place in his philosophy. Even in his nonfiction, notably *Timequake*, Vonnegut explicitly sets time at the center of consciousness.

⁹ Incidentally, *The Sirens of Titan* was published in the same year as C.P. Snow's *The Two Cultures and the Scientific Revolution*. Sigman notes this also.

¹⁰ Some discussion of Heinlein's "All You Zombies—" has arisen among physicists interested in strange loop phenomena in time travel. A recent example includes physicist

Michio Kaku's use of the story in his lectures at City University of New York to demonstrate time paradoxes. Philosophers and engineers have also explored this story as an example of loop phenomena in time travel, notably the work of Paul J. Nahin and Alasdair Richmond. See Chapter Three for a concise treatment of Heinlein's work in relation to Vonnegut.

¹¹ Among the moderns, Joyce perhaps most notably adopts a nonlinear approach to narrative in his seminal works *Ulysses* and *Finnegan's Wake*. Among the postmodern authors, Jorge Luis Borges, Gabriel Garcia Marquez, Philip K. Dick, and Joseph Heller are frequently cited as experimentalists in this regard.

¹² Heisenberg's Uncertainty Principle, part of the Copenhagen interpretation of quantum theory, followed from the atomic theories of Neils Bohr.

¹³ See Note 11

¹⁴ In *Time and Narrative*, much of Ricouer's theory follows the lead of Aristotle. However, his emphasis on personal narratives as a source of meaning and as a mode of configuring reality distinguish him from Aristotle.

¹⁵ See Deleuze and Guattari's *A Thousand Plateaus: Capitalism and Schizophrenia*

¹⁶ *Strangification* in this sense refers to Wallner's usage of the term to explore the validity of scientific paradigms. Wallner distinguishes two types of reality, *Wirklichkeit* (the environment or given world) and *Realität* (physical reality). The former is a "microworld" used to understand the latter.

Verfremdung was also coined by Brecht as a means of joining everyday experience with transcendental experience. For Brecht, "Verfremdung is a part of a larger process that does not end with the shock of estrangement, but instead proceeds on a dialectical path to a new level of greater understanding" (Carney 18). This definition is also relevant to my co-option of the term since, in some sense, I am proposing that Vonnegut's texts seek to join relativistic time on the grand cosmic scale with the time of common everyday experience.

An alternative definition from Cohen et al is also instructive. The authors define strangification as a "set of strategies having one thing in common: they are transferring one (logical) system of propositions from their original context into another context" (106). The type of strangification I adopt in this thesis is the "ontological type of strangification," defined as "[a]pplying a system (a set) of methods of one discipline to a very different discipline" (107). While I have attempted to bridge the gulf between theoretical physics, philosophy, and literary criticism, my methods have remained within the boundaries of textual analysis rather than empirical experimentation.

NOTES FOR CHAPTER TWO

¹⁷ For full accounts of these effects, consult Albert Einstein's *Relativity*, a comprehensive explanation of his ideas that takes into account contributions from other thinkers in the years after the debut of the special and general theories.

¹⁸ Both of these names offer interesting digressions. Constant certainly suggests a mathematical constant, most likely the speed of light posited by Einstein, while Beatrice certainly brings to mind the central female of Dante Alighieri's oeuvre. The former likely symbolizes the materialist worldview of science. In many ways, Malachi Constant parallels Hesse's Siddhartha, who moves from a life of decadence to a greater understanding of reality. Indeed, Siddhartha's quest to escape *samsara* finds an analog in Constant's quest to escape "punctual" reality and realize the deeper meaning of life. In addition, Beatrice probably represents the spiritual worldview discussed by Dante. That Beatrice and Constant unite might suggest that Vonnegut is attempting a fusion of religion and science in the work.

In fact, his shamanistic tendencies which have been much noted by critics certainly indicate that Vonnegut does strive to synthesize pragmatic religion with science in his work. Vonnegut's role as shaman raises several intriguing lines of inquiry. Foremost among these considerations is the supplanting of the shaman by the scientist. Despite recurring skepticism toward unquestioning acceptance of science, Vonnegut cannot extricate himself from the ubiquity of science as *the* epistemological system of late capitalism. Stanley Schatt observes that throughout *ST* "there is also a marked counterculture rejection of technocracy's reliance upon science and the acceptance of a shamanistic view of the world" (41). This view for Vonnegut manifests in a fusion of the facts of science with the systems of philosophy.

¹⁹ The schizophrenia hypotheses raised by Broer and other critics makes several valid points. However, on the matter of strange time, schizophrenia fails to explain the temporal discontinuity of Rumfoord and Pilgrim. Several reasons underlie this disagreement. First, there exists a fundamental distinction between clinical schizophrenia and schizophrenia as metaphor, though critics frequently confound the two. The symptoms of the former generally involve spatial rather than temporal disjunction. There are perceptual abnormalities of time but not the type exhibited by Pilgrim. A schizophrenic patient's delusions are fantastic and illogically connected. Pilgrim's unusual condition conforms to neither of these symptoms. His dilemma is spatio-temporal, and his alleged delusions are largely actual artifacts of his past rather than fantasies. In his case, Post-Traumatic Stress Disorder (PTSD) would be a more appropriate metaphor for Pilgrim's condition.

As for schizophrenia as metaphor, this coincides with Deleuze and Guattari's description of schizophrenia as a cultural malady of late capitalism. Here, I find an abundance of parallels within both of Vonnegut's novels. Both Pilgrim and Rumfoord live fractured through spacetime and both suffer from their conditions (Rumfoord only at his dematerialization on Titan, Billy via his jaunts through time). These conditions are

metaphors for the disjointed state of late capitalism, whereby history becomes another grand narrative, meaning functions as a multiplicity, and narrative time becomes a multivalent stream of simultaneous, conscious events.

Adopting the latter definition, Vonnegut's texts do exhibit schizophrenic tendencies. They express the anxiety concomitant with the realization that time is not absolute and, by the tenets of both special relativity and Gödelian universes, one where moments do indeed exist simultaneously. While Hofstadter suggests a wide array of mental processes as strange loops, schizophrenia remains undiscussed in this context. However, the perceptual abnormalities of clinical schizophrenia as well as the symptoms of cultural schizophrenia support the argument that strange time defies traditionally held standards of temporality in both its simultaneous configuration and its affinity with strange loops.

²⁰ cf. Lunquist's comment that "[Billy] invents the Tralfamadorians to make his madness accord with some vision of reality" (53). Again, there is no need to assume insanity if we suspend our disbelief.

²¹ Boethius expands this idea about God in *De Consolatione Philosophiae*. Aquinas follows a similar argument in his *Compendium Theologiae*.

²² For a thorough treatment of tenselessness, see William Lane Craig's *The Tenseless Theory of Time: A Critical Examination*. This work explores the most famous tenseless theories of time, including those of Arthur Prior, D.H. Mellor, and J.J.C. Smart.

²³ Vonnegut discusses his skepticism at length in his nonfiction, notably in *Palm Sunday* and his last work, *A Man Without A Country*.

²⁴ Again, Aquinas discusses this aspect of God in his *Compendium Theologiae*. In a more contemporary treatment, Douglas Estes discusses this possibility at length. His work explores the connections between relativity, including Gödel's corollaries, and the Gospel of John. Significantly, Estes remarks that the "idea of a block universe contrasts with one of the major philosophical ideas about time – the 'eternal now'" (80). Estes clarifies the distinction quite well and applies the revelations of relativity to the narrational structure of the Fourth Gospel. In many ways, Estes's work employs a similar methodology to the one I employ here in the present investigation. Furthermore, his work presents a concise, well-informed summary of scientific, philosophical, and literary theories of time.

²⁵ This myth originated in the Enlightenment as science began to assume primacy as an epistemological system. The socio-economic effects of new technologies resulting from scientific advances identified science with the capitalist mode of production and innovation. Later, Marxist thinkers adopted the myth of progress to justify the Marxist call for worldwide revolution. Since science was so intricately bound with the modes of production, Marxist thinkers would later incorporate the myth of progress into their own

mythology and subsequently embrace science and its concomitant materialism.

²⁶ Fukuyama's *The End of History and the Last Man* and Baudrillard's *The Mirror of Production* explore this supposition.

²⁷ Early experiments supporting Einstein's prediction of time dilation were carried out by Ives and Stilwell (1938, 1941) and Rossi and Hall (1941). Hawking discusses these and other experiments in *A Brief History of Time*.

²⁸ Ketterer equates Rumfoord with the Cheshire Cat, the infundibulum with the well, and the Rumfoord mansion door to the various strange doors throughout the Alice books. Interestingly, after Rumfoord dematerializes, all that remains is his smile (*SHF* 35). Broer also notes parallels between the world of *ST* and Carroll's Alice books (30).

²⁹ Among the most notable of these is the idea of a strange loop, investigated in many of Carroll's paradoxes.

³⁰ I treat the contributions of Robert A. Heinlein and Philip K. Dick in Chapter Three.

³¹ See Bertrand Russell *The ABC of Relativity*, which also discusses Putnam's well-known argument for space-time independent of Einstein's assumptions.

³² Two other instances to the phrase "space eternal" occur in the text (158, 215) The temporal adjective again suggests Minkowskian space-time.

³³ Nietzsche's idea is perhaps derived from Plato. Nietzsche explores it in both *The Gay Science* and *Thus Spoke Zarathustra*. Eliade formulates a similar idea in *The Myth of the Eternal Return or, Cosmos and History*.

³⁴ Moore's *Watchmen* is the only graphic novel to ever win a Hugo award. The structure of the novel has drawn the attention of critics interested in the dynamic between Einsteinian relativity and the notion of free will explored by Bergson.

³⁵ See Fraser's article "The Ever-Presence of Eternity."

³⁶ Perhaps punctual time is more like Kantian time, a phenomenon largely created by the subject, whereas the noumenal reality is infundibulated time (evidence of this reality resides in the capacity of consciousness to access past, present, and future via the mechanisms of memory, attention, and planning respectively). Vonnegut's narratives imply such an interpretation of time. It is the interaction between the two that concerns strange time. Perhaps they are levels of each other, like the fantasies of Propositional Calculus discussed by Hofstadter? In *I Am a Strange Loop*, Hofstadter follows a suggestion he makes in *GEB* and argues that consciousness operates like a strange loop.

³⁷ Mustazza makes a similar suggestion about the Tralfamadorians in *SHF*, comparing them explicitly to Miltonic angels.

³⁸ Lundquist remarks that “the overall effect of the direct, often choppy, sentences and the brief paragraphs (several times consisting of only a few words) is to suggest the whirring of basic particles, of electrons that really cannot be seen. What we think of when we think of the structure of the atom is not actually there at all – it is only a model, an illusion. The same thing can be said of *Slaughterhouse-Five* and Billy Pilgrim's erratic revolutions in time around Dresden” (83). This is interesting in light of the focus on relativity. The possibility that Vonnegut considered other theories like Heisenberg's is certainly tenable and deserving of a study in its own right. We will briefly treat this possibility in Chapter Four.

³⁹ Burgass notes this connection as well: “Trafalmadorian plot construction is coherent with four-dimensional time; their novels are emphatically anti-Aristotelian and bear a singular resemblance both to Derrida's idea of writing and Melquiades' fictional technique in *One Hundred Years of Solitude*” (181).

⁴⁰ Of course, despite the hackneyed metaphors, neither consciousness (as Rorty denied) nor art is absolutely mimetic. Rather, both concepts are likely interpretive, originating in creative processes evolved for advanced problem solving. Vonnegut's failure is not an artistic one but rather a symptom of his own inability to transcend linear, conscious time. We must also note that Vonnegut claims that the novel is only “somewhat” in the style of Tralfamadore, absolving himself from the impossible task of duplicating such an alien form of narrative (pun intended).

⁴¹ I mean “myth” here in the sense of a sacred ontology, a cosmogony [cf. Hesiod], or an etiology. In other words, a narrativized means of expressing otherwise inexpressible truths. This use of myth is not to be confused for “falsehood.” I emphasize the functional capacity of myth, not its ability to convey validity. As Daniel Dennett notes, we must be wary of “the recently fashionable tribe of postmodernists, who like to claim that modern science is just another in a long line of myths, its institutions and expensive apparatus just the rituals and accoutrements of yet another religion” (*Freedom Evolves* 5).

NOTES FOR CHAPTER THREE

⁴² The article appeared in a special issue of *Reviews in Modern Physics* to commemorate Einstein's 70th birthday. During Gödel's tenure at the Institute for Advanced Study at Princeton, he developed a strong friendship with Einstein. They formed a discussion group there that included such noteworthy thinkers as Wolfgang Pauli and Bertrand Russell. See Yourgrau for a full treatment of the Einstein-Gödel friendship.

⁴³ Notable attempts to refute Gödel's claim were made by North in 1965 and Chari in 1960. Ozsvath and Schucking in 1962 pursued a project to re-evaluate the infinite nature of Gödel's universe, but their work subsequently supported Gödel's claims. All of these studies are discussed by Lockwood.

⁴⁴ A *time-like curve* is defined as “[e]very world-line of an ordinary object.” A *world-line* is the punctual representation of an object's position in four-dimensional space-time. According to Lockwood, a “curve is said to be timelike if, in the vicinity of every event on the curve, it lies within the light-cone centred on that event. In other words, the curve, at every event along its length, is oriented at a steeper angle than the surface of the light cone centred on the event” (45-46). For an accessible and scholarly presentation of these terms, see Lockwood's *The Labyrinth of Time*.

⁴⁵ Nahin remarks that Gödel's corollary implies the possibility of time travel. However, he is careful to illustrate the plethora of opponents to this opinion, across a variety of fields.

⁴⁶ For the original presentation of Gödel's work, see his article “An Example of a New Type of Cosmological Solution of Einstein's Field Equations of Gravitation.”

⁴⁷ Hofstadter continues this study in *I Am a Strange Loop*, which investigates the implications of strange loop phenomena in consciousness.

⁴⁸ Hofstadter notes the recursive nature of relativistic quantum mechanics (*GEB* 142). Another aspect of recursion he addresses is *recursive enumeration*, “a process in which new things emerge from old things by fixed rules” (152). This is intimately connected with so-called chaos theory and the mathematics of fractals.

⁴⁹ Vonnegut also pays homage to Carroll in *Breakfast of Champions*, when Kilgore Trout explains that mirrors are “leaks” that “. . .,” a possible reference to *Through the Looking Glass*. Vonnegut's frequent recourse to fiction within fiction is also a literary trend he shares with Carroll. The frequent inclusion of stories within *Alice's Adventures in Wonderland* and *Through the Looking-Glass* parallel Vonnegut's tendency to insert fictional works in his own fiction. Hofstadter's discusses this type of “push” and “pop” procedure as an instance where strange loops often appear. The levels of fiction, like the fantasies of Propositional Calculus, often contribute to strange loops, where the fictional work within a fictional work in some ways creates the higher-order fictional work. The interaction between these types of fantasies occur often in Vonnegut. For example, many of Kilgore Trout's books describe the events of Vonnegut's own books that are describing Trout's books, ad infinitum. This is yet another example of strange loop tendencies in Vonnegut's fiction.

⁵⁰ The Carroll Paradox is treated at length by Hofstadter. This chain of reasoning requires that statements within statements validate their qualifiers. Gödel's own Incompleteness Theorem, which proved the incompleteness of mathematics, is a similar paradox. There is undoubtedly a strong connection between this type of paradox and the "Liar's Paradox" (vis a vis, "This statement is false"), or even the Cretan Epimenides' paradoxical statement that "All Cretans are liars." These types of strange loops approximate the Carroll Paradox.

⁵¹ This does not preclude the claim I made earlier that strange time is a simultaneity. Indeed, all points on a circle do exist simultaneously but can only be experienced as isolated events, if we take this metaphor to its logical conclusion.

⁵² Heinlein, often called "The Grand Master" of the genre, has influenced generations of science fiction writers. His importance for the genre, indeed for literature as a whole, is well argued by Robert Silverberg: "No one who has written fiction since 1927 or so can fail to take into account Hemingway's theory and practice without seeming archaic or impossibly naïve; no one since 1941 has written first-rate science fiction without a comprehension of the theoretical and practical example set by Heinlein" (324-325). Vonnegut's prose often garners comparisons to Hemingway, but his debt to Heinlein has yet to be explored.

⁵³ The Grandfather Paradox refers to the consideration in philosophy of whether you would exist if you went back in time to kill your own grandfather. A version of this paradox was most famously explored in the film *Back to the Future* where Marty McFly interrupts the serendipitous meeting of his own parents, thereby endangering his own existence.

⁵⁴ Parker rightly notes that Hofstadter never suggests that Carroll is part of this "triumvirate," but rather that his methods were an excellent means of communicating the intricacies of strange loops.

⁵⁵ Geodesics in Einsteinian geometry were largely a method of configuring space-time by non-Euclidean means.

⁵⁶ Bach's Endlessly Rising Canon is one of Hofstadter's favorite examples of a strange loop in *GEB*. Interestingly, Pilgrim plays Bach's "A Mighty Fortress Is Our God" during maneuvers during his time in the service. While this connection is certainly coincidental, it is certainly tantalizing. An examination of the role of music in Vonnegut's fiction would certainly illustrate the bridge between music and time. For example, in *The Sirens of Titan* Rumfoord becomes incredibly interested in good music only after his accident in the chrono-synclastic infundibulum.

⁵⁷ The connection between Billy Pilgrim and Bunyan's work has been elaborated by Klinkowitz, Mustazza, and others.

⁵⁸ Beyond temporal considerations, strange loop phenomena exist in Vonnegut's tendency to insert himself into the texts, fully aware of his authorial role. He frequently remarks that he wants to be a character in his own fiction.

This experimentation with the division between author and text is a result of a disintegration between two levels. Vonnegut exists in the text as he writes the text. Like Escher's hands drawing hands, he exists as a strange loop. Hofstadter himself briefly discusses authorial strange loops and this interaction between text and author provides an important corollary. Even Vonnegut's assertion that "I am myself a work of fiction" finds a curious analog in Hofstadter's work titled *I Am a Strange Loop*.

NOTES FOR CHAPTER FOUR

⁵⁹ Russell most notably discusses the philosophical ramifications of relativity in his accessible *ABC of Relativity*

⁶⁰ Before we dismiss Laplace, we must note the similarities between the Tralfamadorians in *Slaughterhouse-Five* and the so-called Laplace's demon. Laplace's demon is a hypothetical being that can perceive all time events simultaneously. In essence, knowing the state of the universe at any given moment, a Laplacian determinist could hypothetically (given an almost infinite knowledge of physical laws) know the state of the universe at all other points, just as Laplace's demon does. The reason why Vonnegut's universe is not truly Laplacian is because he does not anywhere explicitly assert the necessity of physical laws for determining future events.

⁶¹ Most famously in *A Brief History of Time* and the subsequent *The Universe in a Nutshell*.

⁶² Sigman's article is a cogent exploration of Vonnegut's use of modern concepts in physics in his fiction. Sigman also notes trends that I discuss here, including Vonnegut's references to Lewis Carroll and his awareness of Snow's work.

⁶³ Noel's name blatantly refers to Santa Claus. The non-existence of Noel during Malachi's childhood draws our attention to the connection between the illusory Father Christmas and the absentee father. Furthermore, this connection certainly reflects Constant's (and perhaps Vonnegut's) relationship with God in the novel.

⁶⁴ Contrary to Boon's position, Chaos Theory is not a cohesive means of interpretation or a set of paradigms. Rather, it is a fashionable word for mathematical systems that appear to exhibit chaotic behavior. Recent research in neuroscience has adopted the mathematics of fluid dynamics and other fields that show that small perturbations to stable systems can lead to instability that was once discussed in terms of chaos. For a full treatment of the mathematics, see Strogatz's *Nonlinear Dynamics and Chaos Theory*.

⁶⁵ Loosely defined, this principle states that an observer cannot know both the velocity and position of a subatomic particle due to the physics of particles moving so close to the speed of light.

⁶⁶ I have largely ignored one of Vonnegut's later works, *Timequake*, which further develops his temporal constructs and discusses free will. The piece's genre proves difficult to define, as it oscillates freely between fiction and nonfiction (a common Vonnegutian technique). For this reason, I have omitted it from the present study, which attempts to focus on strange loop tendencies in his fiction. Whether *Timequake* demonstrates strange loop properties is yet to be determined, but this seems likely in light of its conceptual similarities with Vonnegut's other novels. For our purposes, it is important to note that the premise of *Timequake* finds striking analogs in both *ST* and *SHF*, reinforcing my argument that time constitutes one of Vonnegut's primary concerns throughout his oeuvre.

⁶⁷ We must also heed Morse's warning: "There also has been a certain amount of misreading of Vonnegut's work because some critics want to find in it something that simply is not there" (*Kurt Vonnegut* 19).

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