

THE QUALIFIED OPTIMISM OF GRAVITY'S RAINBOW

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ABSTRACT

Gravity's Rainbow is both an historical document that captures the Zeitgeist of the 1960s through allusions to the theoretical writings of such popular philosophers as Herbert Marcuse and Norman O. Brown, and a justification of the questioning spirit that motivated those writers. Pynchon uses their ideas along with many aspects of scientific theory to present a dark world which is essentially the negative of their optimism. The result, however, is not pessimism, but optimism qualified by the reality that necessitates it.

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INTRODUCTION

When critics praise Gravity's Rainbow, they frequently do so by comparing Pynchon and his work to other authors and works, past and present. One need go no further than the numerous press reviews preceding the text in the Bantam paperback edition of the novel to see evidence of the illustrious company amongst whom Pynchon is numbered: "Moby Dick and Ulysses...come to mind most often as one reads Gravity's Rainbow...Gravity's Rainbow marks an advance beyond either."¹ Few critics seem immune from the temptation to describe Gravity's Rainbow in terms of earlier "masterpieces," as David Thorburn does:

Relying on an apparently limitless fund of knowledge and commanding a prose style whose richness and suppleness justify comparison with Dickens and Joyce, Pynchon is capable of overwhelming scenic vividness. (70)

Jules Siegel opens his memoir of Pynchon, "Who Is Thomas Pynchon...and Why Did He Take Off With My Wife," writing "Thomas Ruggles Pynchon, Jr., is the most famous invisible writer since J. D. Salinger, the most admired since B. Traven, the most difficult since James Joyce" (97). Tony Tanner, who is not blind to the uniqueness of the novel, still cannot avoid making such comparisons: "Pynchon has created a book that is both one of the great historical novels of our time and arguably the most important literary

text since Ulysses" (75). These comparisons are heady praise indeed, but praise that tells us more about the critics who utter it than about Pynchon and his book.

Besides showing their critical biases, the comparisons made by Thorburn, Siegel, Tanner, and others reveal a need on the part of scholars, critics and other writers to find a place for Pynchon in an Anglo-American literary continuum. Similarly, when Gravity's Rainbow is condemned, it is because the condemning writer cannot find a place for the novel in that continuum. An anonymous letter to the editor of the Marquette Tribune complained that the novel's only redeeming quality is dietary: "If you are on a diet, read it before every meal. You'll never want to eat again."² Lunch being too naked, the novel does not fit this particular writer's definition of literature, and, indeed, the only words he or she can offer by way of defining the novel are "gross" and "crap."

David Thorburn, while acknowledging that "Pynchon's extended, vividly concrete scenes of surreal degradation, masochism, and aggression must be regarded as a crucial, wholly legitimate aspect of his work" (69), dismisses the novel because of its "jigsaw-puzzle elaborateness" and "comic-strip fragmentation," and questions whether the work is really "literature" or "a frenzy that muddles the distinction between literature and pathology and that leads

ultimately to self-defeating confusion" (69). Thorburn concludes his article on Gravity's Rainbow with this revealing judgement:

That the author of Gravity's Rainbow is ambitious and talented is surely true. But I think he has not yet written a book in which his powerful intuition of crisis and his hunger for coherence have yielded fully to the claims of art (70).

Thorburn's criticism of the novel inevitably takes the form of a questioning of the book's "literariness."

Warner Berthoff, in dismissing the novel, is at least honest enough to afford it a vague semi-literary category when he describes Gravity's Rainbow as "among modern superfictions, one of the least re-readable" (70). Still, he cannot describe the novel without referring to it in terms of "non-literary forms": the novel is encyclopedic" and filled with "lecture-course and newspaper-file facticity" (70-74). Berthoff closes his discussion of Gravity's Rainbow with the rebuff that such a novel

can have no durable hold on our natural interest in human and historical existence, in either its largest or its smallest configurations; no more than an epileptic seizure, though remarkable to observe and furnishing information perhaps not otherwise to be obtained, can take hold as a first measure of functioning human consciousness. (76)

Again, the novel is judged in terms of what it is not.

All of the critics that I have quoted, whether ecstatic or dismissive, are engaged in the altogether human obsession of finding structure, but most, in my view, are

searching for Pynchon in all the wrong places. Pynchon himself showed, in a rare expository article ("Is it O.K. to Be a Luddite?"), that he has more sympathy for and similarities with writing and movements outside of the mainstream of Anglo-American literature. He writes:

if we do insist upon fictional violations of the laws of nature--of space, time, thermodynamics, and the big one, mortality itself--then we risk being judged by the literary mainstream as Insufficiently Serious. (41)

He thus recognizes something outside of the mainstream--something to which he goes on to ally himself:

The Methodist movement and the American Great Awakening were only two sectors on a front which included Radicalism and Freemasonry as well as Luddites and the Gothic novel. Each in its way expressed the same profound unwillingness to give up elements of faith, however "irrational," to an emerging technopolitical order that might or might not know what it was doing. (41)

This mistrust of an "emerging" order--the wish to conserve--and its coexistent opposite--the wish to embrace the new order, which eagerly accelerates, without reservation, into an inevitable apocalypse (the death instinct)--that organize Pynchon's Gravity's Rainbow.

"Mistrust," however, is not an adequate word to describe the nature and strength of Pynchon's attack; the operational term is "paranoia." For Pynchon, paranoia is an extension of the quintessential intellectual trait, the need to find structure--ways of connecting diverse phenomena. The alternative, anti-paranoia, "where nothing is

connected to anything," is literally unthinkable, and "a condition not many can bear for long" (Gravity's Rainbow 506). The nearest Pynchon comes to defining paranoia in Gravity's Rainbow occurs upon Roger Mexico's induction into the "counterforce" (743-4). Prentice explains that for every officially sanctioned structure, or "They-system," there should be an equally well-developed counterstructure, or "We-system." "They-systems" are expedient: they simplify and control the way we perceive reality. "We-systems," officially defined as "delusions" ("'delusions' are always officially defined."), are more concerned with what is possible, what may be: "We don't have to worry about questions of real or unreal," says Prentice. Quite clearly, such "creative paranoia" does not solve problems in "They-systems," but merely seeks to strike a kind of dialectical balance. Roger accuses Prentice of "playing Their game," and Prentice replies, "Don't let it bother you. You'll find you can operate quite well. Seeing as we haven't won yet, it isn't much of a problem." Here is another salient aspect of paranoia: marginality. Despite their name, "We-systems" are basically solipsistic. No two paranoias are alike; there is no way to organize paranoids into a cohesive body. A Paranoid Party would seem to be as contradictory as an Anarchist Party since organization would imply that the party is an extension of the system it seeks to depose. Thus Prentice is being overly optimistic when he says they

haven't won yet: winning is completely out of the question when cohesion is a product of shared opposition rather than shared ideology. This "counterforce" must remain exactly that: counter to the prevailing force, opposed to the exercise of power over individuals. As Pynchon says elsewhere in Gravity's Rainbow, we "must go on blundering inside our front-brain faith in Kute Korrespondences...to make sense out of, to find the meanest sharp sliver of truth," in the world we perceive (688).

In "Is it O.K. to Be a Luddite?," King Lud, the archetypal technophobe, is Pynchon's example of the paranoid activist, or "dedicated Badass" (40). Ned Lud was responsible (according to the Oxford English Dictionary) for smashing two stocking-frames in 1779, but his name came to be associated with all such cases. All who took part in such activities were known as Luddites, although this seems to imply far a more cohesive group than could possibly have existed, suggesting perhaps a "paranoia" of "They-systems," and by Pynchon's account a well-founded one, since:

there is a long folk history of this figure, the Badass. He is usually male, and while sometimes earning the quizzical tolerance of women, is almost universally admired by men for two basic virtues: he is Bad, and he is Big. Bad meaning not morally evil, necessarily, more like able to work mischief on a large scale. What is important here is the amplifying of scale, the multiplication of effect. (40)

This "amplifying of scale" and "multiplication of effect"

are what Thorburn disapproves of when he complains about the "fantastic doublings and triplings and quadruplings of plot and subplot, the wildly unchecked impulse to surreal enlargement and exaggeration" (69). "Subversive Badass literature" may be the closest we can come to summing up Gravity's Rainbow in a single phrase.

I have said that finding structure is an entirely human obsession, but it is, more particularly, a Puritan obsession. Scott Sanders notes that "God is the original conspiracy theory" ("Pynchon's Paranoid History" 177). The Puritans read the world around them as a ledger of election and preterition. At least two characters in Gravity's Rainbow are haunted by ancestral thinking habits. Pynchon writes of Slothrop, "Signs will find him here in the Zone, and ancestors reassert themselves" (327). William, the first American Slothrop, contributes not only to Tyrone's paranoid tendencies, but to his sympathy for and membership in "the Zone's lost" (549). William's religious tract, On Preterition, was "among the first books to've been not only banned but also ceremonially burned in Boston" (647). Katje's ancestor, Frans van der Groov,

went off to Mauritius with a boatload [sic] of these live hogs and lost thirteen years toting his haakbus through the ebony forests, wandering the swamps and lava flows, systematically killing off the native dodos for reasons he could not explain. (125-6)

Whether Frans was trying to prove his election or cursing

his preterition, he provides the novel with another symbol (the dodo) for the lost souls of the Zone, and a frame of reference for Katje's sympathies with the preterite, and membership in the counterforce. Whatever one's personal beliefs, the Puritan notion of a Provident God can still be a powerful influence in the way one seeks order in the world. As Scott Sanders expresses it,

A mind that preserves Puritan expectations after a Puritan God has been discredited will naturally seek another hypothesis that explains life as a product of remote control, that situates the individual within a plot whose furthest reaches he cannot fathom, that renders the creation legible once again. ("Pynchon's Paranoid History" 177)

The short leap from Puritanism to paranoia is emphasized by their association in Gravity's Rainbow.

There has long been an unwritten law that when science and literature mix, their progeny is science fiction and not literature. In the nineteenth century, Keats had illustrated a growing dichotomy between art and science in his poem, "Lamia":

Do not all charms fly
At the touch of cold philosophy?
There was an awful rainbow once in heaven:
We know her woof, her texture; she is given
In the dull catalogue of common things.
Philosophy will clip an Angel's wings,
Conquer all mysteries by rule and line,
Empty the haunted air, and gnomed mine--
Unweave a rainbow, as it erstwhile made
The tender-person'd Lamia melt into a shade.³

Pynchon notes that, far from being mitigated in this technological age, the problem has been aggravated:

As a visit to any local library or magazine rack will easily confirm, there are now so many more than two cultures that the problem has really become how to find the time to read anything outside one's own specialty. ("Is it O.K. to Be a Lud-dite? 1)

Pynchon's answer to this most postmodern of problems lies, I would suggest, in what Berthoff dismisses as "newspaper-file facticity" (70). This "facticity" rather than being a flaw, is in fact evidence of an overwhelming interdisciplinarity that requires the reader to sink or swim through oceans of literature, history, philosophy, psychology, physics, mathematics and the occult.

When reading Gravity's Rainbow, it is important to keep this interdisciplinarity in mind. Keats's poem objects to the spectral analysis of the rainbow, the drawing of lines between the colours. Pynchon actively subverts our notions of science and progress by tearing down the barriers between disciplines and looking for the "meanest sharp sliver" (Gravity's Rainbow 688) of correspondence, of conspiracy. Most will be familiar with von Clausewitz's famous definition of war as "a continuation of political activity by other means" (On War 87), and perhaps with Bertholt Brecht's Marxian update: "War is a business proposition:/ But not with cheese, with steel instead!" (Mother Courage 287). Pynchon, however, chooses not to attribute the war to any particular force nor, for that matter, to even recognize the boundary between war and

peace, but chooses rather to see the war as a vague conspiratorial "They-system" in operation:

Yesyes, Skippy, the truth is that the War is keeping things alive. Things...The Germans-and-Japs story was only one, rather surrealistic version of the real War. The real War is always there. The dying tapers off now and then, but the War is still killing them in more subtle ways. (Gravity's Rainbow 751)

Behind this paranoia is the suggestion that no history, no single intellectual construct, can capture the multiplicity of the truth. Similarly, Pynchon treats all scientific, technological, and psychological enterprises as linked and exposes the correspondences and contradictions that contribute to the generalized uncertainty of the postmodern world.

Gravity's Rainbow is an historical novel poised on the cusp of two conflicting realities. Pynchon applies tensor analysis to history:

there ought to be nodes, critical points...there ought to be super-derivatives of the crowded and insatiate flow that can be set equal to zero and these critical points found...1904 was one of them. (527)

1945, the period surrounding the close of the Second World War, is such a node. Scientists, and many laymen as well, had been aware for some time of a gradual shift in the way we perceive the world, but, if there is a single symbol for the advent of a new age and our awareness of the transition, it is that "sudden white genital onset in the sky" (Gravity's Rainbow 809), the mushroom cloud. Less obvious

perhaps is the parabola symbol, the flightpath of the rocket; gravity's rainbow itself. The mushroom cloud and the parabola are linked by the genital metaphor. Pynchon writes:

Katje has understood the great airless arc as a clear allusion to certain secret lusts that drive the planet and herself, and Those who use her--over its peak and down, plunging, burning, toward a terminal orgasm. (260)

Here the central symbol of the novel, the parabola, is clearly an allusion to the Freudian death instinct, and it is this instinct that seems to be the prime motivational force in the world projected by Pynchon. As Pynchon himself says in the introduction to Slow Learner, "When we speak of 'seriousness' in fiction ultimately we are talking about an attitude toward death" (xiii). The danger of the death instinct is compounded by the frame of mind that accompanied the development of nuclear weapons and rocketry: these weapons were not only scientific triumphs but technological ones as well. Technology involves more than the simple application of scientific principles and methodology to a specific task. It involves a particular way of thinking not limited to the immediate problem at hand. Robert K. Merton writes:

The Technical Man is fascinated by results, by the immediate consequences of setting standardized devices into motion. He cannot help admiring the spectacular effectiveness of nuclear weapons of war. Above all, he is committed to the never-ending search for "the one best way" to achieve any designated objective.⁴

The emphasis here is on effectiveness rather than on desirability. We have the knowledge to annihilate ourselves, but, what is more frightening, we have the capability--it is not unthinkable.

Gravity's Rainbow is historical in another sense. As Lawrence C. Wolfley has said, the novel is "a sixties novel born late" (876). Pynchon deals with so many fashionable, counter-cultural ideas of the sixties that he captures, possibly better than any other work before or since, the Zeitgeist of those years. Sixties counter culture was a flowering of "We-systems" inconsistent with each other (universal love while burning the Establishment to the ground) but with a common enemy (American foreign policy). In 1968, Theodore Roszak declared the "primary project" of counter culture to be

to proclaim a new heaven and a new earth so vast, so marvelous that the inordinate claims of technical expertise must of necessity withdraw in the presence of such splendor to a subordinate and marginal status in the lives of men. (240)

Rozzak's euphoria is nowhere to be seen in Gravity's Rainbow. Rather, it is the unspoken corollary to Roszak's dream that is the main concern of Pynchon's novel: the widespread dissatisfaction that led people to seek alternatives to the status quo. In Gravity's Rainbow, it is hope that remains largely unspoken, but it is there, nevertheless, in the ideas Pynchon borrows from or shares with

popular thinkers of the day such as Herbert Marcuse and Norman O. Brown. Pynchon's optimism is of a rather qualified variety. It is qualified by the Reality Principle (or, more particularly, in Marcuse's terminology, the performance principle) of which it is the irreconcilable and inseparable opposite. Gravity's Rainbow is the negative projection (beyond the zero?) of sixties optimism, but the net effect of such a projection is not pessimism, but a reinforcement of the need for counter-cultural optimism. What I propose to do in the following pages is to explore Thomas Pynchon's qualified optimism through his use of scientific, technological, and psychological ideas. More specifically, the first chapter will concern scientific paradigms in general (with reference to T. S. Kuhn), and the entropy paradigm (so prevalent in Pynchon's work) in particular. The second chapter will be devoted to Pynchon's use of the technological rationale (with reference to Jacques Ellul and Herbert Marcuse), and behavioural psychology (with reference to B. F. Skinner). The third chapter will be an investigation of the concept of the death instinct as it is developed in Freud, Marcuse, and Brown.

The Entropy Paradigm

Readers of Pynchon cannot help but be struck by his extensive use of scientific theory and of the entropy paradigm in particular. To understand Pynchon's use of science, it is first of all necessary to understand the nature and relativity of scientific models or paradigms. A. O. Lovejoy's monumental study, The Great Chain of Being, describes one model that greatly influenced thought from the Middle Ages to the Nineteenth Century and which probably influences our thought still in much the same way as Scott Sanders shows Puritan theology to influence the characters of Gravity's Rainbow. According to Lovejoy, chain-of-being theory

provided the chief basis for most of the more serious attempts to solve the problem of evil and to show that the scheme of things is an intelligible and rational one;...the same belief about the structure of nature lay in the background of much early modern science. (viii)

In Gravity's Rainbow, it is Brigadier Pudding who most clearly exemplifies the passing of this idea:

Ernest Pudding was brought up to believe in a literal Chain of Command, as clergymen of earlier centuries believed in the Chain of Being. The newer geometries confuse him. (88)

Pudding is also confused by the political and economic intrigues that go on around him as his "subordinates" manoeuvre for funding:

Pudding could only respond by adopting rather an Old Testament style with everyone, including the dogs, and remaining secretly baffled and hurt by what he imagined as treachery high inside Staff. (89)

Pointsman, one of Pudding's "subordinates," appears to be quite comfortable with the intrigues at the White Visitation, and yet the idea of the chain persists in Pointsman's rhetoric:

[Pavlov's] hope was for a long chain of better and better approximations. His faith ultimately lay in a pure physiological basis for the life of the psyche. No effect without cause, and a clear chain of linkages. (102)

It is strange to hear a twentieth-century scientist speaking in these terms, and it is interesting to note that Pointsman eventually fails in his scientific endeavours, fortunately for Slothrop (if one can call his fortune good or indeed call it fortune at all). Both Pointsman and Pudding are eventually left behind largely because the model through which they perceive the world cannot account for the phenomena they encounter.

Pointsman's faith in Pavlov's "long chain of better and better approximations" reveals a basic misapprehension concerning the nature of science itself. To regard the process of scientific development as a simple accumulation of knowledge extending in a linear evolution from the distant past and on into the future is to ignore the history of science. Pointsman cannot, however, see history in any other

way than as a chain. The statistical point of view held by Roger Mexico can only be regarded as a threat by Pointsman:

How can Mexico play, so at his ease, with these symbols of randomness and fright? Innocent as a child, perhaps unaware--perhaps--that in this play he wrecks the elegant rooms of history, threatens the idea of cause and effect itself. What if Mexico's whole generation have turned out like this? Will Postwar be nothing but "events," newly created one moment to the next? No links? Is it the end of history? (64-5)

The idea of history--and especially the history of science--as a continuous string of causes and effects was undermined in the early 1960s by Thomas S. Kuhn's The Structure of Scientific Revolutions. According to Kuhn science is more than a collection of data:

Observation and experience can and must drastically restrict the range of admissible scientific belief, else there would be no science. But they cannot alone determine a particular body of such belief. An apparently arbitrary element, compounded of personal and historical accident, is always a formative ingredient of the beliefs espoused by a given scientific community at a given time.
(4)

In other words, the linear accumulation of data is not solely responsible for the advance of science: there must be something to structure the data.

In Kuhnian terms, that something is a paradigm. Kuhn defines paradigms as "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners" (viii). The fact that scientists work within a paradigm does not mean that they necessarily recognize fully its nature:

Scientists work from models acquired through education and through subsequent exposure to the literature often without quite knowing or needing to know what characteristics have given these models the status of community paradigms. And because they do so, they need no full set of rules. (Kuhn 46)

Kuhn's concept of the paradigm corresponds closely to the poststructural or Althusserian concept of ideology in that it is a set of shared and largely unconscious beliefs that do not require constant verification in order for the group to function. It is Kuhn's view that paradigms are never discarded lightly, and that the historical movement from paradigm to paradigm is a revolutionary process rather than a cumulative one (12). The traumatic nature of paradigm shifts is, perhaps, a product of their relative infrequency: according to Kuhn, the "major turning points in scientific development [are] those associated with the names of Copernicus, Newton, Lavoisier, and Einstein" (6), but, he emphasizes, many lesser episodes in the history of science, such as Clerk Maxwell's equations in thermodynamics, have had revolutionary, though less recognized, importance for scientific thought (7).

Copernicus, Newton, Einstein--these are all well-known names, but what of the countless scientists whose names we never hear? Do they have a role in the history of science? Very little of the scientific enterprise and very few scientists are devoted to developing new paradigms. The

majority of scientists are concerned with defending and articulating paradigms already in place--with the practice that Kuhn calls "normal" science. The "normal" scientist only accidentally deals with anomalies in his research; his aim is to demonstrate the "truth" of the existing paradigm rather than to undermine it. Thus "normal" science resembles less a cumulative advance into the unknown than it does a rearticulation of what is already believed. According to Kuhn, the average "normal" scientist is an "expert puzzle-solver" who spends his time "achieving the anticipated in a new way" (36). In Gravity's Rainbow, it is Pointsman who provides the clearest example of a scientist fully in the grip of a paradigm: Pavlov has shown the way and Pointsman is merely filling in the data, looking for the anticipated "true mechanical explanation" (102). The puzzle that Pointsman has before him in the novel is the missing link between Slothrop's rocket-oriented erections and the rocket. Pointsman has the effect, anticipates the cause, and has simply to find the link between them:

But the stimulus, somehow, must be the rocket, some precursor wraith, some rocket's double present for Slothrop in the percentage of smiles on a bus, menstrual cycles being operated upon in some mysterious way--what does make the little doxies do it for free? Are there fluctuations in the sexual market, in pornography or prostitutes, perhaps tying into the prices on the Stock Exchange itself, that we clean-living lot know nothing about? Does news from the front affect the itch between their pretty thighs, does desire grow directly or inversely as the real chance of sudden death--damn it, what cue, right

in front of our eyes, that we haven't the subtlety of heart to see?... (99)

Despite the depth of his puzzlement, Pointsman does not doubt for a minute that he will eventually find the missing link. As a "normal" scientist, he cannot properly function with such a doubt. As Kuhn says, "Though intrinsic value is no criterion for a puzzle, the assured existence of a solution is" (37). In his peroration on his quest for the link, the word "if" does not occur to Pointsman at all; rather, he says, "When we find it, we'll have shown again the stone determinancy of everything, of every soul. There will be precious little room for any hope at all. You can see how important a discovery like that would be" (99-100). Important--and frightening: Pointsman is so unconscious of paradigms that he can talk of "souls" in the same breath as complete physiological determinism (in Pavlovian terms, there is only physiology). He is so involved with puzzle-solving that he has no thought of human consequences.

An important aspect of Kuhn's work is the doubt he casts on the absolute objectivity of science. Pointsman's faith in Pavlov and reverence for "the Book" that Pavlov wrote are typical of "normal" science. Textbooks, says Kuhn, are "pedagogic vehicles for the perpetuation of normal science" (137), or, in other words, devices for upholding and preserving paradigms. The biblical analogy is obvious and Kuhn notes that reverence for and proliferation of texts

is "one of the aspects of scientific work that most clearly distinguishes it from every other creative pursuit except perhaps theology" (136). The emergence of new paradigms is rarely a cause for rejoicing in a scientific community. Because commitments to scientific paradigms are usually less than scientifically objective, the transition from paradigm to paradigm resembles a holy war more than an enlightenment. Kuhn's analogy is, once again, theological: "The transfer of allegiance from paradigm to paradigm is a conversion experience and cannot be forced" (151). Science is thus not so far removed from theology as its professed objectivity would lead one to expect. A paradigm requires, ultimately, a leap of faith.

In the more than two decades since Kuhn's book appeared, his ideas have been discussed and adopted by many disciplines besides those of "pure" science. One recent article by Terrence Ball discusses the impact that Kuhn's ideas have had in political science and some of the objections that have been raised to Kuhn's views. One of the major objections expressed in the political science community concerned the "all-or-nothing" picture of paradigm shifts that Kuhn seems to paint. Ball remarks that

the Newtonian paradigm was not a monolith until Einstein demolished it utterly; it was, rather, a ravaged shell of a theory, cracked in many places, and no longer able to support the ever-increasing weight of the evidence against it. Kuhn's "big-bang," or revolutionary, account of scientific change does not fit the facts, even here. (29)

Granted that Kuhn's account appears somewhat black-and-white, this criticism still misses the essential point of Kuhn's work which is the explanation of the dynamic of change in the sciences. It has been said that "many a beautiful theory has been destroyed by an ugly fact." Kuhn's insight is that this is not the nature of scientific change at all; a theory cannot be overturned simply by a fact. A contrary fact remains merely an anomaly until a new paradigm is found to explain the fact. In Gravity's Rainbow, Pudding and Pointsman cannot explain occurrences through the chain paradigm, but this problem does not cause them to abandon the paradigm, because they have nowhere to go, no readily available new paradigm to adopt. Imre Lakatos has emphasized that Kuhn's enterprise "concerns our central intellectual values, and has implications not only for theoretical physics but also for the underdeveloped social sciences and even for moral and political philosophy."⁵ In literary theory, Stanley Fish's work may be said to owe a debt to Kuhn. In Is There a Text in This Class?, Fish writes:

What I finally came to see was that the identification of what was real and normative occurred within interpretive communities and what was normative for the members of one community would be seen as strange (if it could be seen at all) by the members of another. In other words, there is no single way of reading that is correct or natural, only "ways of reading" that are extensions of community perspectives. (15-16)

Kuhn has partially broken down the artificial disciplinary boundaries amongst "pure" science, "social" science, and the humanities.

One of the concepts that this growing awareness of scientific thought has served to popularize is that of entropy, derived from the second law of thermodynamics. In fact, entropy has been applied across disciplinary lines so widely that there is a danger of missing its metaphorical, paradigmatic status. Kuhn himself notes the hold that statistical thermodynamics have gained in the minds of scientists and the idea has been used in so many disciplines and contexts that a popular literature has started to grow up around the subject. Jeremy Rifkin has written (with ghost-writer Ted Howard) a sensational (and sensationally flawed) account of entropy in its many applications, making sweeping claims of entropy's apocalyptic importance for history, technology, metaphysics, economics, agriculture, the military, education, health, and Christianity--all in 260 pages. Rifkin will provide an excellent example of the dangers of being seduced by the seemingly simple and irrevocable nature of entropy, or, for that matter, by any single paradigm or metaphor.

Entropy became a buzzword in the fifties, but, as with most such words, its meaning has remained vague. In Slow Learner, Pynchon writes, perhaps not wholly in jest, that, "If Clausius had stuck to his native German and

called it Verwandlungsinhalt instead, it could have had an entirely different impact" (xxii). There is an apocryphal story that, when Claude Shannon was looking for a word to describe uncertainty in the transmission of information, he was told to use entropy, because "no one knows what entropy is, so in a debate you will always have the advantage."⁶ "Entropy," notes Jeremy Campbell, "is a word which carries a large historical freight of good physics, profound paradox, dubious analogies, and flights of metaphysical fancy" (32). The first law of thermodynamics (literally "the movement of heat") is the law of conservation of energy, that energy is neither created nor destroyed. While the first law measures quantity, the second law measures quality of energy--its usefulness in performing tasks. Rudolf Clausius, who formulated these laws and coined the term "entropy," summed up the first two laws succinctly: "The energy of the universe is a constant. The entropy of the universe tends to a maximum" (Campbell 37). Clausius formulated these laws in the Nineteenth Century with a purely mechanical thermodynamic device, the steam engine, in mind. Entropy was seen as a physical property, as being simple and mechanical. In order for a steam engine to perform work, heat must "flow" from a higher temperature to a lower temperature, from usable to unusable, and that energy, in the form of heat, is not destroyed but irreversibly

transformed so as not to be available to perform any other task. Energy, in other words, tends to disperse, to move towards a state of equilibrium. Seen on a universal scale, entropy denotes the movement of the universe towards eventual and inevitable "heat death" or equilibrium, the cessation of motion and thus life (Rifkin 45).

In Pynchon's early short story, "Entropy," the character Callisto undergoes a Kuhnian conversion to a cosmology of entropy when he realizes that "the entropy of of an isolated system always continually increases," and that "the isolated system--galaxy, engine, human being, culture, whatever--must evolve spontaneously toward the Condition of the More Probable" (Slow Learner 72-3). Pynchon's terminology would appear to have been lifted directly from Norbert Wiener's The Human Use of Human Beings:

As entropy increases, the universe, and all closed systems in the universe, tend naturally to deteriorate and lose their distinctiveness, to move from the least to the most probable state, from a state of organization and differentiation in which distinctions and forms exist, to a state of chaos and sameness. (12)

Callisto draws an analogy between thermodynamics and contemporary (1950s) society:

He saw, for example, the younger generation responding to Madison Avenue with the same spleen his own had once reserved for Wall Street: and in American 'consumerism' discovered a similar tendency from the least to the most probable, from ordered individuality to a kind of chaos. (74)

The story depicts two reactions to the "heat death" of

American society. Callisto reacts by adopting a kind of bunker mentality, living in a "Rousseau-like fantasy," isolated in a

hothouse jungle it had taken him seven years to weave together. Hermetically sealed, it was a tiny enclave of regularity in the city's chaos, alien to the vagaries of the weather, of national politics, of any civil disorder. (68)

Callisto isolates himself by attempting to build a personal closed system, and waits, not half-confident that he can stave off the seemingly inevitable end. In contrast to Callisto's island of order in a sea of chaos, although equally in reaction to society, is Meatball Mulligan's lease-breaking party in the apartment directly below Callisto's. Callisto hopes that he is "strong enough not to drift into the graceful decadence of an enervated fatalism" (73), and it is decadence, whether graceful or not, that characterizes Mulligan's party, forty hours old at the beginning of the story:

On the kitchen floor, amid a litter of empty champagne fifths, were Sandor Rojas and three friends, playing spit in the ocean and staying awake on Heidseck and benzedrine pills. In the living room Duke, Vincent, Krinkles, and Paco sat crouched over a fifteen-inch speaker which had been bolted into the top of a wastepaper basket, listening to twenty-seven watts' worth of The Heroes Gate at Kiev. They all wore hornrimmed sunglasses and rapt expressions, and smoked funny-looking cigarettes which contained not, as you might expect, tobacco, but an adulterated form of cannabis sativa. (65)

Here is decadence--a frenzy in the cause of staving off

stagnation, the cessation of motion, or entropy.

In the introduction to Slow Learner, Pynchon does not speak kindly of "Entropy":

Because the story has been anthologized a couple--three times, people think I know more about the subject of entropy than I really do....Since I wrote the story I have kept trying to understand entropy, but my grasp becomes less sure the more I read. (xxii-xxiv)

Pynchon is, I think, being somewhat modest, but he is correct when he says his grasp of entropy has matured with time: his treatment of the subject is far more sophisticated in Gravity's Rainbow.

Callisto's vision is entropy at its most deterministic, and this apocalyptic vision is Rifkin's as well, but both are seduced by the apparent simplicity of the entropy principle. To view entropy in this deterministic way is to ignore the fact that entropy is a statistical quality more than an observable physical quality (Campbell 39). Being statistical, entropy is subject to probability much as Mexico notes the rockets falling on London to be. Pointsman, looking for a deterministic projection from Roger's data, asks "Can't you tell...from your map here, which places would be safest to go into, safest from attack?" Roger replies:

I'm sorry. That's the Monte Carlo Fallacy. No matter how many have fallen inside a particular square, the odds remain the same as they always were. Each hit is independent of all the others. Bombs are not dogs. No link. No memory. No conditioning. (64)

Pointsman's mistake is to assume that, because a number of rockets can be observed to behave in a certain way, a prediction can be made as to the behaviour of future rockets. Pointsman is looking for determinism, for links between successive events. However, in terms of probability, each new event is unrelated to the preceding events. Each rocket falls at random. Jeremy Rifkin is fond of attributing to entropy an "iron hand" (52) of strict determinism, maintaining that "every single physical activity that humankind engages in is totally subject to the iron-clad imperative expressed in the first and second laws of thermodynamics" (8). This is "the truth that will set us free" (205). It becomes increasingly clear that Rifkin has undergone a Kuhnian conversion, that he is entirely trapped within the entropy paradigm, and that his conversion is not just vaguely analogous to a religious experience:

There is great beauty in the Entropy Law. It guides us through the cosmic theater with a bittersweet authority, assured of the ultimate fate that lies ahead but leaving to us the decision of how to proceed. (251)

Rifkin is looking for the same kind of assurance of purpose and direction in a causal view of entropy that Pointsman is seeking in the "stone determinacy of everything, of every soul" (99-100). Both have succumbed to paradigms. Both try to determine reality absolutely through intellectual constructs. A distinction must be made between engineering and

metaphysics: what is a certainty for a technician is not necessarily an eternal verity for a philosopher.

Pynchon's use of entropy in Gravity's Rainbow seems to take into account the uncertainty of intellectual constructs while retaining the metaphorical force of the paradigm. He still finds the entropy paradigm a useful vehicle for social, political, and economic commentary:

Taking and not giving back, demanding that "productivity" and "earnings" keep on increasing with time, the System removing from the rest of the World these vast quantities of energy to keep its own tiny desperate fraction showing a profit: and not only most of humanity--most of the World, animal, vegetable and mineral, is laid waste in the process. The System may or may not understand that it is only buying time. And that time is an artificial resource to begin with, of no value to anyone but the System, which sooner or later must crash to its death, when its addiction to energy has become more than the rest of the World can supply, dragging with it innocent souls all along the chain of life. Living inside the System is like riding across the country in a bus driven by a maniac bent on suicide. (480-1)

Entropy is "time's arrow" (Eddington 76), and if time is of use only to the "System," then it follows that entropy is the very essence of the "System," that entropy, the violation of the cyclical renewals of nature, is "Their" conspiracy. The use of entropy in this way is not problematic. However, Pynchon also uses entropy as it is applied to information theory. Norbert Wiener has said that "it is possible to interpret the information carried by a message as essentially the negative of its entropy" (21). The application of the concept of entropy to information theory marks

an important shift in focus. In thermodynamics, entropy is regarded as a physical quality. In information theory, entropy is a quality of perception, a factor limiting what can be known. Entropy is the noise that limits the reception of information (Campbell 34-5). Slothrop intuits a relationship between entropy and information:

It's not the gentlemanly reflex that made him edit, switch names, insert fantasies into the yarns he spun for Tantivy back in the ACHTUNG office, so much as the primitive fear of having a soul captured by a likeness of image or by a name...He wants to preserve what he can of her from Their several entropies. (352)

The more "They" know of one, the more open one is to manipulation, and the entropy mentioned here may perhaps be a reference to the entropy that is the inevitable byproduct of information gathering (Campbell 49). David R. Mesher writes of "Their" enterprise in Gravity's Rainbow:

They cannot know or control everything; this would be theoretically possible only in a state of maximum entropy. But Their efforts to gather information and to synthesize impell us ever closer to that state, which is Their ultimate objective in any case. (167)

Maximum entropy is the point at which everything is known, but that everything is in fact nothing, because maximum entropy is the absence of information: in a state of equilibrium, there is nothing to be known. Entropy is used in Gravity's Rainbow, in a highly metaphorical fashion, to indicate the dispersal of the individual, or rather, of the information that comprises our perception of that indivi-

dual, and Slothrop himself is the prime victim in the novel:

[he] was sent into the zone to be present as [sic] his own assembly--perhaps, heavily paranoid voices have whispered, his time's assembly--and there ought to be a punch line to it, but there isn't. The plan went wrong. He is being broken down instead, and scattered. (860-1)

As Slothrop becomes more an object of study, he becomes less an individual, more a dossier (861ff.) and less a real person. He becomes the sum of what others perceive. Bodine is "one of the few who can still see Slothrop as any sort of integral creature any more. Most of the others gave up long ago trying to hold him together, even as a concept--'It's just got too remote''s what they usually say" (864). No longer perceived as an individual, Slothrop becomes an historical curiosity.

Pynchon's novel, however, holds out possibilities for retarding or reversing this individual entropy. David R. Mesher uses the term "negative entropy" and defines it as "the creation of order...without an entropy-accelerating procedure of ordering" (167). Recall Mexico's exchange with Prentice and Feel concerning "We-systems" and "They-systems:"

It's a little bewildering--if this is a "We-system," why isn't it at least thoughtful enough to interlock in a reasonable way, like They-systems do?

"That's exactly it," Osbie screams...
"They're the rational ones. We piss on Their rational arrangements. Don't we...Mexico?"
 (744)

The important feature of "We-systems" is that they are not constructed rationally, but instead are intuited. They provide, in Mesher's words, "knowledge without information-gathering on which to base it," or "negative entropy" (167). Pynchon himself uses the term "Entropy Management" in a surreal, cabaret-style sketch called "Loonies on Leave" and associates such management with perpetual motion (302). In another reference to the entropy paradigm, Pynchon writes "Energy inside is just as real, just as binding and inescapable, as energy that shows" (789), suggesting that intuitive, internal knowledge informs the world just as much as does entropy-causing, external information gathering. Pynchon's portrayal of entropy in Gravity's Rainbow leaves, perhaps for the first time in his writing, some room for hope. There is a way for his characters to fight against "Them;" survival depends on creative paranoia, on creative subversion--the war that Roger sings of in the counterforce travelling song:

But I'm telling you today,
That it ain't the only way,
And there's shit you won't be eating anymore--
They've been paying you to love it,
But the time has come to shove it,
And it isn't a resistance, it's a war. (745)

There is an emphasis on time in this song and throughout the novel that reflects the desperate and immediate nature of the danger. That emphasis is there again in William Slothrop's hymn which ends the novel, as the rocket hovers

at its "last delta-t": "There is a Hand to turn the time,/
though thy Glass today be run" (887). The last line of the
novel, "Now everybody--," trails off ambiguously into either
apocalypse or expectancy.

Technique

The hope that I find in Gravity's Rainbow should not, perhaps, be overemphasized: there is still the accelerating slide indicated by "that purified shape latent in the sky, that shape of no surprise, no second chances, no return" (244), the parabola that is gravity's rainbow. If the thermodynamic slide is not determined, it still expresses the tendency of the world in Pynchon's projection. That tendency is aided by the technological rationale of action that governs the thought of contemporary man. The term "technique," popularized by Jaques Ellul, describes the habits of mind perceived behind "Their" conspiracies. One has to wonder what the "counterforce" can do to thwart this slide, but as soon as the question is expressed, the verb "do" draws attention to itself. The idea of action gathers pejorative associations in the novel, as, for instance, in the scene where Ensign Morituri prevents Greta Erdman from killing a Jewish child:

For a moment the three of them swayed, locked together. Gray Nazi statuary: its name may have been "The Family." None of the Greek stillness: no, they moved. Immortality was not the issue. That's what made them different. No survival, beyond the senses taking of it--no handing down. Doomed as d'Annunzio's adventure at Fiume, as the Reich itself, as the poor creatures from whom the boy now tore loose and ran off into the evening. (558)

Here the idea of action is connected with the slide into oblivion predicted by the parabola.

Action seldom helps any of Pynchon's characters to find answers. Perhaps the most unanswerable question posed by Gravity's Rainbow is who are "They?" and in seeking a tangible answer to this question, we become sorting demons just as do Oedipa Maas in The Crying of Lot 49, Herbert Stencil in V., and Slothrop in Gravity's Rainbow.

Oedipa searches for a shadowy "organization" called the Trystero, but "They" are not an ordered group with a visible hierarchy and, indeed, "They" may not exist at all, or at least not in the sense that personal pronoun seems to imply. Stencil, himself existing only in the third person, searches for the elusive V. who, it seems, slowly fragments into a mechanical parody of life, and perhaps of our own Zeitgeist, but Stencil finds only a multiplication of possibilities from Veronica the rat to Victoria Wren to Venezuela. Slothrop seeks the Schwarzgerät, a technological grail that he hopes will shed some light on his predicament, while making some sense of the world in general, but, bouncing around the Zone like a particle in a cloud chamber, Slothrop gathers information but no answers. Oedipa's alternatives are to walk away from the "conspiracy" or to go to the auction to seek new information in the hope of showing the Trystero to have an objective existence. But the first alternative is no alternative at all. She has lost her inno-

cence, and when she attempts to ignore the signs around her she fails: "All right, she told herself. You lose. A game try, all one hour's worth. She should have left then and gone back to Berkeley, to the hotel. But couldn't" (81). The second alternative is equally as futile as each new piece of information brings new noise along with it. The gathering process itself is highly entropic, and the "facts" merely confuse. Stencil has at least a sense of the futility of his quest and he chooses to "approach and avoid" (44) his quarry. It is the search itself that is important:

His random movements before the war had given way to a great single movement from inertness to--if not vitality, then at least activity. Work, the chase--for it was V. he hunted--far from being a means to glorify God and one's own godliness (as the Puritans believe) was for Stencil grim, joyless; a conscious acceptance of the unpleasant for no other reason than that V. was there to track down. (44)

It is not life (vitality) that Stencil gains through his activity. He simply avoids becoming inert, or inorganic. Action keeps him in a kind of limbo, and Stencil is aware of a problem, but nowhere near a solution. Slothrop begins to doubt as he flies to Geneva, contemplating "the night skiers far below, out on the slopes, crisscrossing industriously, purifying and perfecting their Fascist ideal of Action, Action, Action, once his own shining reason for being. No more. No more" (309). As long as Slothrop is actively seeking to impose order on his experiences, he is playing

"Their" game, whoever "They" are. The problem for these characters lies not in the seeking, but in the way they seek. As long as they perform the act of information gathering in order to determine their further actions, they use a technological rationale that creates further entropy, further disorder (cf. David R. Mesher, "Negative Entropy and the Form of Gravity's Rainbow").

The pronoun "They" is, of course, misleading, since "They" are a personalized abstraction of the "technological society" (to borrow Jacques Ellul's phrase) issuing from the paranoid mind. We (for we have met the enemy and we are "They") are a society dominated by our technology, and by the methodology that creates, and in turn is reinforced by, technology. That methodology was dubbed "technique" by Jacques Ellul and defined as "the totality of methods rationally arrived at and having absolute efficiency (for a given stage of development) in every field of human activity" (xxv). "Technology," says William Barrett, "is embodied technique" (22). Technique is the rationale of the machine, and a machine, in Barrett's words, is "logically speaking, a decision procedure" (23). Both Ellul and Barrett maintain that we, as a society, tend more and more to reason as machines do, gathering information and acting in the most direct way possible to achieve the simplest solution. All decisions are predetermined by the technique. This machine paradigm has come to govern our actions and

thus, necessarily, our thoughts. Herbert Marcuse notes that society's "basic organization is that of the machine process" (1966, 3).

In a society governed by technique, we all become technicians, specialists in small areas with very little concern for the whole. According to Ellul,

Technique is organized as a closed world. It utilizes what the mass of men do not understand. It is even based on human ignorance....The individual, in order to make use of technical instruments, no longer needs to know about his civilization. And no single technician dominates the whole complex....The human hand no longer spans the complex of means, nor does the human brain synthesize man's acts. Only the intrinsic monism of technique assures cohesion between human means and acts. Technique reigns alone, a blind force and more clear-sighted than the best human intelligence. (93-4)

Mankind is, as it were, and to extend the machine metaphor, asleep at the wheel. In Ellul's view, it is technique, and thus the needs of technology that are foremost in this technical world. The force is blind because it focuses on means, ignoring the desirability of the end results. It is clear-sighted in that it has a singularity of purpose unmatched by human intelligence. "Slothrop," says Sir Stephen Dodson-Truck, "we're all such mechanical men. Doing our jobs. That's all we are" (251). Ellul quotes Jacques Soustelle's remark concerning the atomic bomb: "Since it was possible, it was necessary," and notes that this is "really a master phrase for all technical evolution" (99).

In Gravity's Rainbow, it is Franz Pökler who best exemplifies the new breed of technical man. His fascination with rocket technology is completely technical in Ellul's sense of the word: "no one's ever done it before. I couldn't believe it Leni I saw something that, that no one ever did before..." (189). Even before the war, Pökler and his colleagues in the "Verein für Raumschiffahrt" have no concern for the source of their funding or the military purposes of their funders: "The choice was between building what the Army wanted--practical hardware--or pushing on in chronic poverty, dreaming of expeditions to Venus....Money is money" (467). For technical man, this choice is no choice at all. Once involved in wartime research, Pökler moves away from theoretical to engineering concerns and displays technical man's dominant rational tendency towards simplicity: "The danger...lay in being seduced by approaches that were too sophisticated,...the real engineering problem...was to keep things as simple as possible" (473-4). As Pökler becomes more specialized, more of a technician, he becomes less able to deal with human problems and more willing to abdicate responsibility to the state. His wife, Leni, leaves him, taking their daughter, Ilse, with her, but they end up in a "re-education" camp. When "Ilse" is brought to visit, Pökler contemplates his diminishing role and control:

Nights in the cubicle, with Ilse curled a few feet away in a canvas army cot, a little gray squirrel under her blanket, he'd wonder if she wasn't real-

ly better off as a ward of the Reich. He'd heard there were camps, but saw nothing sinister in it: he took the Government at their word, "re-education." I've made such a mess of everything... they have qualified people there...trained personnel...they know what a child needs... (478)

The notion that one needs technical training in order to raise a child points to Pökler's over-specialization and to his immersion in technique: there must be an officially, technically defined method used in every task. "Each link in the chain does what it does without knowing what the whole chain is about," says William Barrett. There is an intense irony to the fact that, in an information age, "We would end by building a tower of Babel where each layer of the structure cannot communicate with the next" (135). Pökler's case suggests that there is no way to separate the rationale of the workplace from one's "private" life.

Pökler, however, is not a monster, and Pynchon must be given credit for a sympathetic portrayal of a character whom we are loath to see in ourselves. We all become technicians in a world of specialization, and a technician is "a device for recording effects and results obtained by various techniques" (Ellul 80). Ellul emphasizes the mechanical quality of the technician:

Technicians are not very complicated beings. In truth, they are as simple as their techniques, which more and more assimilate them. The Communists are no doubt right in thinking that all moral problems will be resolved when all men are technicians. (389)

While there is, no doubt, some truth to this view, it is

somewhat simplified in itself. In Pökler, Pynchon portrays not a machine, but a man growing more mechanical (like V. and Tchitcherine), a man whose humanity is receding but not gone and not passing without some very human anxieties. Technique may "modify man's very essence" (Ellul 325) in a truly Procrustean manner, but the process is not one hundred percent efficient as no technology can be. Pökler is not happy; enter Weissmann to modify his condition by introducing "Ilse" to the equation. When Pökler feels guilt for having been away while his colleagues died in a bombing raid, Weissmann alleviates his guilt and reintegrates him into the community of technicians by placing him at Ground Zero for a rocket test (496). Weissmann is a technician overseeing technicians, an example of entropy at work: each new technology creates side effects and the need for new technologies to maintain order.

As the methodology of technology comes to be seen as the only rational course of action, it becomes increasingly the blueprint for all enterprises, but is technique as natural as it seems? In his epiphany in Gravity's Rainbow, Enzian sees the bombing of an industrial complex as a "decoding," a "conversion," and concludes that

this War was never political at all, the politics was all theatre, all just to keep the people distracted...secretly, it was being dictated instead by the needs of technology...by a conspiracy between human beings and techniques, by something that needed the energy-burst of war crying, "Mon-

ey be damned, the very life of [insert name of Nation] is at stake," but meaning, most likely, dawn is nearly here, I need my night's blood, my funding, funding, ahh more, more. (606-7)

Enzian's epiphany can be described as a translation from one paradigm (political) to another (technological). Technique may be merely a paradigm that sees the world in terms of machine processes, but it is a paradigm that we systematically apply.

The way that we embrace technology in every aspect of society recalls Kuhn's statement that paradigm changes resemble religious conversions. There is often a fervour about technical man: he is convinced that he has the answers. Pynchon makes the association between technique and religion explicit by making religion itself a technique. In the words of Wimpe the narcotics salesman, "Religion was always about death. It was used not as an opiate so much as a technique--it got people to die for one particular set of beliefs about death" (818). History, read in terms of technique, is a succession of more and more complex techniques of mass control. In Wimpe's view, Marx exposed religion as the opiate of the masses only to unwittingly supply a new technique, a new set of beliefs for which to die, the "predestined shape" of history (818). Pökler's colleagues find peace in their technological endeavours by invoking various kinds of "rocket mysticism." Mondaugen, to whose "electromysticism" Pökler gives the mock trinity of "the cathode, the

anode, and the holy grid," defines his notion of "Nirvana" as "the pure, the informationless state of signal zero" (470-1). These scientists hide the nature of their endeavour, which is systematic death, by shrouding it in a mysticism that gives their "mission" a spiritual purity to which it has no claim. Another example of this rocket mysticism is the rendering of an engineering rule-of-thumb as a parable with Enzian playing the role of prophet. The parable summarizes the conflict between theory and practice, pure science and engineering with pure science being condemned as pride: "Avoid pride, and design to some compromise value" (365-6). It is Enzian himself who gives expression to the consequences of elevating technology:

Go ahead, capitalize the T on technology, deify it if it'll make you feel less responsible--but it puts you in with the neutered, brother, in with the eunuchs keeping the harem of our stolen Earth for the numb and joyless hardons of human sultans, human elite with no right at all to be where they are--. (607)

Denying our responsibility, we deny our awareness: we accept the status quo without even the possibility of questioning its justice.

One might wonder if technique is really as pervasive a power as this analysis makes it appear. What of the more traditional forces of politics and economics? In reply it should be noted that politics and economics are not separate from technique, but are often, rather, expressions of technique in different paradigms. Machiavelli's The Prince

is technique made explicit. Machiavelli sets out with one priority, the preservation of the state, and everything-- people, religion, virtue, the prince himself--is expendable in the pursuit of that goal. The code of ethics put forward by Machiavelli, says George Bull, is "one which most men, even if they as often as not subscribe to it in practice, find repellent when it is justified in theory."⁷

Technique is just such an idea: although the machine paradigm governs much of our thinking, we prefer to keep it away from consciousness. Enzian's epiphany casts doubt on the supremacy of politics; Ellul notes that political boundaries are becoming less meaningful in the technological society:

European nations in general are being compelled to renounce political sovereignty and form associations designed to realize far-reaching technical operations, as, for example, research projects in atomic energy (1958), the exploitation of the Sahara (1958), the launching of an artificial satellite (1960). (249)

Pynchon makes a conspiracy of this trend, suggesting that technology in the hands of multinationals such as Shell Oil is not controlled by political boundaries. Slothrop makes a connection at the dawn of paranoid consciousness:

"I mean," Slothrop now working himself into a fuss over something that only disturbs him, dimly, nothing to kick up a row over, is it? "doesn't it strike you as just a bit odd, you Shell chaps working on your liquid engine your side of the channel you know, and their chaps firing their bloody things at you with your own... blasted...Shell transmitter tower, you see."
(280)

But nobody does see: as Wimpe says elsewhere, "Connection?"

Of course there's one. But we don't talk about it" (405). In the tradition of Orwellian Newspeak, if we have no name for something, it has no existence.

Wimpe also tells Tchitcherine that "our little cartel is the model for the very structure of nations" (406).

Ellul makes a similar point when he says:

we must include in the technical framework the great private enterprises, whose technical principles are identical with those of the state. Indeed, it may be said in general that the state lags behind the great corporations in this respect and that it is compelled to modify and rationalize its administrative, judicial, and financial systems on the model of the great commercial and industrial enterprises. (249)

It is technique, the technological frame of mind, that, more and more, structures the business world--Wimpe's "rational economy" (406)--and politics. To engage in political activism without an awareness of this structuring force merely "allows the human being to exist in the technical milieu, but it is regression nonetheless, and a corollary to the general flight into unconsciousness" (Ellul 403). Political activity without consideration for technique merely gives the illusion of participating in the power structure.

The United States and the Soviet Union are at the leading edge of the technological revolution and, thus, it is in these two countries that technique is most dominant. Pynchon hints at the ascendancy of these cultures often in the course of Gravity's Rainbow. Tantivy talks of "Yank

expertise" (212) in connection with such a seemingly untechnical subject as finding women; effectiveness is referred to as an "American heresy" (86); Tchitcherine's physical safety and spiritual death sentence is his usefulness to the anonymous Soviet bureaucracy (712). Perhaps the most telling clue to technique's grip on the United States is the case of the German rocket scientist, Achtfaden. Captured by the Schwarzkommando after trying to disappear in the Zone, Achtfaden explains his behaviour: "I couldn't go with von Braun...not to the Americans, it would only just keep on the same way" (532). The dehumanizing specialization described by Pökler does not end with the needs of the war but continues in the U. S. space program and in large corporations such as the Yoyodyne Corporation in The Crying of Lot 49. Stanley Koteks complains that "every engineer, in signing the Yoyodyne contract, also signed away the patent rights to any inventions he might come up with" (61). The engineer loses his individuality, becoming part of a "team" and taking neither responsibility nor credit for deeds committed collectively.

Ellul refers to technique as a "conditioning" force (xxix): we are all conditioned to some degree by the methodology of technology. Efforts have been made, most notably by B. F. Skinner, to consciously apply technique to the conditioning of human behaviour. In 1971, Skinner argued, in Beyond Freedom and Dignity, that our knowledge of phys-

ics and biology had by far outstripped our knowledge of human behaviour, that "Aristotle could not have understood a page of modern physics or biology, but Socrates and his friends would have little trouble in following most current discussions of human affairs" (3). He blamed our lack of understanding of human behaviour for our difficulties in adapting to an increasingly technological world. The answer, according to Skinner, is to apply technology itself to human behaviour: "what we need is a technology of behavior. We could solve our problems quickly enough if we could adjust the growth of the world's population as precisely as we adjust the course of a spaceship" (3). Skinner claimed that, by manipulating our environment--the collection of stimulæ responsible for our behaviour--we could be conditioned to act in harmony with our changing and increasingly technological world, and that mankind could no longer afford the luxuries of the freedom and the dignity of the individual: "what is being abolished is autonomous man--the inner man, the homunculus, the possessing demon, the man defended by the literatures of freedom and dignity" (191).

America's behaviourists are the heirs of Pavlov, and it is the Pavlovian, Pointsman, who demonstrates behaviourism in Gravity's Rainbow. Slothrop, having already been victimized by the behavioural experiments of Dr. Laszlo Jamf, becomes of double interest to Pointsman because of his

"rocket dowsing" ability. Causality would seem to be a temporal phenomenon--causes always being followed by effects. In order to explain the behaviour of Slothrop's penis in behavioural terms, the response has to be put before the stimulus, effect before cause. Pointsman is unable or unwilling to consider possibilities outside of his Pavlovian paradigm and must qualify the paradigm ever more subtly in order to save it in the face of an anomaly (Slothrop). Pointsman is forced into the Pavlovian theoretical contortions of "paradoxical" and "ultraparadoxical" phases in order to describe (but not explain) Slothrop in stimulus response terms (55-6). There is no evidence of the mystery stimulus actually existing, but Pointsman is incapable of considering alternative explanations because of his convictions. Skinner too is unable to see, or unwilling to admit, the paradigmatic status of his views. In Walden Two, the narrator, Professor Burris, declares that Frazier's behaviourist Utopia will be successful "if he can avoid committing himself stubbornly to some theory" (130). When Frazier is accused of indoctrinating his citizens, he replies,

Indoctrination is a hard word....We don't propagandize in favor of our way of life, except to present what we think is a fair comparison of other types of society....We don't poke fun at the rest of mankind or laugh at their stupid economic or social practices. All we use is unbiased information. (205)

Skinner presents what amounts to total slavery to a paradigm as freedom from theory and his Utopian behaviourist claims

that the educational process which he has designed uses only "unbiased information," when he cannot even guard his own speech from prejudice against "stupid" practices.

Behaviourism looks at the human mind as a physiological stimulus response mechanism: "No effect without cause, and a clear train of linkages," as Pointsman says (102). "We think with our bodies," writes Skinner in Walden Two (127). The brain is as linear as a flow chart, a binary decision process, and Pointsman cannot conceive of mental life in any other terms: "in the domain of zero to one, not-something to something, Pointsman can only possess the zero and the one. He cannot, like Mexico, survive anyplace in between" (63). William Barrett remarks, concerning behaviourism, that "to condition a human being, from the sheer determinist point of view, is logically similar to programming a computer" (115), and he suggests that "the dominant myth of our time may very well become that of Frankenstein's monster" (24). The determinism of nineteenth-century science can still be found in today's behavioural psychology, but it is no more convincing here than in thermodynamics, or Darwinian natural selection. Behaviourism assumes the human mind to be a closed system, that there is "a pure physiological basis for the life of the psyche," in the words, once more, of Pointsman (102). Barrett rejects this assumption with a question: "if a sys-

tem of the mind's devising so elementary as that of arithmetic proves recalcitrant to formalization, is it likely that the mind that created it will be less complex and more easily constrained within rules?" (115). Any attempt to reduce the human mind to such a system is unlikely to meet with more than partial success.

Theoretical considerations aside, the question remains as to whether or not behavioural control can be considered ethical. When Spectro questions the wisdom of experimenting with Slothrop, he dismisses ethical considerations as irrelevant: his main concern is for the validity of the experiment, since a sample of one cannot conclusively demonstrate anything (55). Pudding, with perfect nineteenth-century propriety, questions Pointsman on the subject:

Pudding: Isn't it all rather shabby, Pointsman? Meddling with another man's mind this way?

Pointsmen: Brigadier, we're only following in a long line of experiment and questioning. Harvard University, the U. S. Army? Hardly shabby institutions.

Pudding: We can't, Pointsman, it's beastly.

Pointsmen: But the Americans have already been at him! don't you see? It's not as if we're corrupting a virgin or something--

Pudding: Do we have to do it because the Americans do it? Must we allow them to corrupt us? (96)

Pointsmen seems unable to think in ethical terms, as though that particular toggle in his own binary brain were switched to zero. Without an overall perspective that includes eth-

ics, the behaviourist himself becomes a technician and, as Webley Silvernail remarks, "this lab here is also a maze, i'n't it now...behaviorists run these aisles of tables and consoles just like rats and mice" (267). By embracing technique, the behaviourist submits himself to the most rigorous of conditioning. Skinner's behaviourism is a concerted effort to apply technique to human psychology, to smooth the transition to Technical Man, but the trend is already established: we do not need to be engineered into compliance with technique. Technique tends to dominate us more and more without such engineering. In Barrett's words,

So long as we can negotiate the triumph of technology successfully, we are unconcerned to ask what the presuppositions of this technical world are and how they bind us to its framework. Already these presuppositions are so much the invisible medium of our actual life that we have become unconscious of them. (223)

Skinner, like Machiavelli before him, is more descriptive than prescriptive, less concerned with ethics than with reality.

Ellul's analysis of the technological society leaves little room for hope or for creative alternatives. He writes:

Nothing can compete with the technical means. The choice is made a priori. It is not in the power of the individual or of the group to decide to follow some method other than the technical. the individual is in a dilemma: either he decides to safeguard his freedom of choice, chooses to use traditional, personal, moral, or empirical means, thereby entering into competition with a power against which there is no efficacious defense and

before which he must suffer defeat; or he decides to accept technical necessity, in which case he will himself be the victor, but only by submitting irreparably to technical slavery. In effect he has no freedom of choice. (84)

Ellul sounds like the voice of doom and yet he claims there is no determinism involved in the advance of technique, but that the scenario he gives is only likely to occur (xxx). He finds no hope in art, as "modern art expresses the subconscious precisely to the degree that the subconscious has been influenced by the machine. The artist is in fact a seismograph that records the fluctuations of man and society" (404). However, Ellul seems to regard art as a single act rather than as an activity involving both act and perception. He seems to view art as static rather than dynamic.

Herbert Marcuse's vision is less bleak than Ellul's, but certainly as critical of the new technological order.

In One-Dimensional Man, Marcuse writes:

The union of growing productivity and growing destruction; the brinkmanship of annihilation; the surrender of thought, hope, and fear to the decisions of the powers that be; the preservation of misery in the face of unprecedented wealth constitute the most impartial indictment--even if they are not the raison d'etre of this society but only its by-product: its sweeping rationality, which propels efficiency and growth, is itself irrational. (xiii)

This vision of the technological society is only less bleak because Marcuse finds a role for art that is central, and traditional, though extremely threatened. Marcuse holds that literature has traditionally had a subversive social

function, especially those works presenting "such disruptive characters as the artist, the prostitute, the adulteress, the great criminal and outcast, the warrior, the rebel-poet, the devil, the fool--those who do not earn a living, at least not in an orderly and normal way" (59). Marcuse is not speaking here of all literature, but there are certainly many works in the English, French, and German traditions that fall into the category of "Badass" literature that Pynchon associates himself with in "Is It O.K. to Be a Luddite?" Literature of this sort made people aware of the mundane world's flaws and of another dimension, of a "higher" or "transcendent" reality, a realm of absent possibilities: "literature and art were essentially alienation, sustaining and protecting the contradiction--the unhappy consciousness of the divided world, the defeated possibilities, the hopes unfulfilled, and the promises betrayed" (61). The awareness of the limitations of rational thought, the medium of daily participation in the Reality Principle, induced by an awareness of another aspect of reality that is beyond rational explanation, is what Marcuse calls "two-dimensional" thought (57). Barrett makes a similar distinction between the rational and the mystical: "science tells us how the world is," but "that the world is, is the mystical" (57). To be aware of the mystical or two-dimensional aspect of existence is to be aware of social imper-

fection and injustice and to recognize the possibilities for improvement. There is thus an irreconcilable but constructive antagonism between culture and social reality.

The effect of the new technology has been to "flatten out" this antagonism by two means. Firstly, "the reality surpasses its culture. Man today can do more than the culture heros and half-gods; he has solved many insoluble problems" (56). In the affluent society, technology is available to the masses and promises to become more so: we contentedly look forward to putting a man on Mars and finding a cure for cancer. Modern comforts create in the individual what Marcuse calls the "happy consciousness" (76), and what Pynchon calls "putting him on the Dream" (813). Secondly, mass media assimilates culture by turning it into a commodity for mass consumption:

If mass communications blend together harmoniously, and often unnoticeably, art, politics, religion, and philosophy with commercials, they bring these realms of culture to their common denominator--the commodity form. The music of the soul is also the music of salesmanship. Exchange value, not truth value counts. (57)

In other words, mass-marketed culture must be accessible and palatable in order to sell (to be consumed), and thus (if it is the antagonism that defines culture) it ceases to be culture at all. One need only consider the recent spate of high-technology adventure shows on television--magic motorcycles, cars, helicopters applied to simple plots and ideas of right versus wrong, good guys versus bad guys--to see

that the antagonism between society and culture has disappeared and that the pseudo-culture left us is an advertisement for the status quo, a surrogate transcendence within the established order, rather than an alienation from technological rationality. "High" culture can exist in this medium only if it can sell soap. This may sound like Marxist sour grapes, but the point is simply this: if the alienating, oppositional function of culture is lost, so too is all hope of self-determination. Technological rationality becomes not just the dominant mode of thought, but the only one. Culture becomes not an escape from control, but an aspect of it. Thought and existence become "one-dimensional." It is this "one-dimensionality" that characterizes art in Skinner's Walden Two. Frazier, the Utopian behaviourist, discusses the prerequisites for artistic production: "You can't encourage art with money alone. What you need is a culture. You must be economically sound and socially acceptable, and prizes won't do that" (89). In Skinner's projection, it is culture (by which he means society as a whole) that determines art, and there seems to be no role for art in influencing culture. Art is a leisure activity for the purpose of enjoyment only. In Gravity's Rainbow, there is a distinction made between two kinds of art. In a sixties-style discussion, abetted by hallucinogens, Säure compares Rossini and Beethoven. The music of

Rossini is conducive to human relationships and subversive to the status quo:

Through the machineries of greed, pettiness, and the abuse of power, love occurs. All the shit is transmuted to gold. The walls are breached, the balconies are scaled....[A] person feels good listening to Rossini. All you feel like listening to Beethoven is going out and invading Poland. (513)

In Säure's interpretation, Beethoven is more open to being co-opted by "Them."

Rossini and Beethoven, however, are pre-technological. In the technological society, the artist must be more subversive to avoid co-option. Jules Siegel recalls a conversation with Thomas Pynchon in which Siegel complained of the difficulty Pynchon's writing presented to the reader. Pynchon reportedly replied "why should things be easy to understand?" (170). Indeed, there is every reason why things should not be easy to understand. The general difficulty of the novel is the "estrangement-effect" which Marcuse, after Bertholt Brecht, attributes to the "avant-garde" of literature. Estrangement is culture's struggle against "absorption into the predominant one-dimensionality" (66). Marcuse quotes Brecht: "the things of everyday life are lifted out of the realm of the self-evident," and "that which is 'natural' must assume the features of the extraordinary" (67). Pynchon's writing overflows with mundane detail ("newspaper-file facticity") which is applied to the non-mundane purpose of consciousness-raising. The

reader is likely to experience a paranoid flashback when encountering such "shadowy" presences as IG Farben in the "real" world. Pynchon's "schlemiel" characters are lifted out of the world's preterite, remarkable for their lack of remarkableness (some would say "underdeveloped," or "flat," but are not all "characters" so in a one-dimensional world?). Even the extraordinary "hero" of Gravity's Rainbow, Tyrone Slothrop, is only extraordinary for what has been done to him, rather than for any inherent quality of his own. What makes the novel subversive, or "Badass," is not the wealth of mundane detail, but the refusal to supply the links between those details. The novel as a whole is a "We-system" that subverts all attempts at rational reduction.

The Death Instinct

Entropy and technique may describe the tendencies of the technological society, but they do not explain why society tends that way. The psychoanalytic concept that deals with this question is the death instinct, and Pynchon demonstrates a familiarity with not only Freud's thoughts on the subject, but also with the re-readings of Freud propounded by his popularizers in the 1950s and 1960s. With the advent of nuclear weapons, and defence strategies such as MAD (Mutual Assured Destruction), annihilation became a very real possibility, and it is not surprising that death became the subject of a number of polemics. Herbert Marcuse and Norman O. Brown wrote such polemics, becoming popular philosophers, and casting spells over large audiences with lively and sometimes fanciful arguments. These writers possess an optimism of a quality not unlike that of the eighteenth-century variety professed by Alexander Pope and Voltaire's Dr. Pangloss: optimism is the attempt to optimize. Brown writes, in Life Against Death, "Utopian speculations... must come back into fashion. They are a way of affirming faith in the possibility of solving problems that seem at the moment insoluble. Today even the survival of humanity is a utopian hope" (305). Eighteenth-century man could look about, see incredible suffering, and yet proclaim:

Cease then, nor order imperfection name;
 Our proper bliss depends on what we blame.
 Know thy own point: this kind, this due degree
 Of blindness, weakness, Heaven bestows on thee.
 Submit. (Pope, Essay on Man I, 281-5)

Submission to Heaven was also submission to societal norms and eighteenth-century optimism was, thus,

in essence an apologia for the status quo, presenting you with a God who loved abundance and variety better than happiness or progress, and a universe whose "goodness" consisted in its containing the greatest possible range of phenomena, many of which seem evil to all but the philosophers.
 (Willey 48)

Marcuse and Brown see the impending annihilation of mankind and offer extravagant arguments for hope. Their counter-cultural optimism emphasizes the destructive nature of the status quo and the arbitrariness of "given" reality.

Pynchon captures the same sort of "optimism" that Marcuse and Brown do, but his presentation differs more drastically than the distinction between the novel and essay forms suggests. Frederick Crews is justified in his criticism of Brown when he says that "psychoanalysis for Brown is not science but poetical philosophy"(26). Brown's Life Against Death and Marcuse's Eros and Civilization may be said to be attempts to reclaim Freud for "poetic philosophy." In Brown's view,

the attempt to make psychoanalysis out to be "scientific" (in the positivist sense) is not only vain but destructive. Empirical verification, the positivist test of science, can apply only to that which is fully in consciousness; but psychoanalysis is a mode of contacting the unconscious under

conditions of general repression, when the unconscious remains in some sense repressed. To put the matter another way, the "poetry" in Freud's thought cannot be purged away. (Life Against Death 320)

It has been said that when Freud wrote of the human psyche, his paradigm was the steam engine (Campbell 19). Brown and Marcuse de-emphasize the mechanistic nature of Freud's thought while putting greater stress on its intuitional, poetic quality. The form of these works, which is nominally expository and empirical (Brown), or dialectical (Marcuse), may mislead the reader into believing that some scientific truth has been reached, but, as Crews remarks of Brown, "he never once deviates into petty considerations of evidence" (27). Brown seems to have anticipated this criticism when writing Love's Body, the sequel to Life Against Death. The second book is aphoristic and disconnected in the extreme. Here is a sentence, chosen at random: "We dwell in Night, the dungeonlike heaven the lid of our coffin; like the vaulted chamber in which the dead Egyptian kings lay, a representation of the heavens as a firmament, or lid" (43). Statements of this nature appear throughout the text in total contextual isolation without the benefit of transitional logic. The form of Love's Body may be more faithful to its subject matter, but the book is not nearly as fascinating an intellectual adventure as the earlier Life Against Death or Marcuse's Eros and Civilization. Brown's pseudo-empirical and Marcuse's "vulgar

Hegelian" (Crews 128) styles differ radically in approach, but share the counter-cultural disrespect for formal argument and the inspirational quality that characterized so many of the intellectual projects of the 1960s.

Pynchon uses many of the same ideas that Marcuse and Brown espouse, but he does so without seeming to make specific theoretical commitments. His method is one of correspondence rather than of logical transitions and theoretical consistency. The death instinct is imbedded in Gravity's Rainbow to such an extent that it can be said to be the novel's central idea: entropy, technique, and the death instinct are essentially the same theme of the universe's drive towards inorganic, chaotic equilibrium. Entropy is the direction of travel, technique the most efficient means of travel, and the death instinct the motivation for going. The novel brings together trends observed, over the last one and a half centuries, in numerous fields of pure and social science. It may be a "fact," as John Gardner says, that "the world is not as Pynchon says it is" (196), and yet the wide applicability of the entropy paradigm allows Pynchon to construct a web of correspondences that goes beyond mere factuality. There is a passage in Gravity's Rainbow that serves to illustrate the relation of empirical evidence to truth that functions in the novel. Pynchon makes a parable of the famous and recently revived controversy in psy-

choanalysis surrounding Freud's early "seduction theory" (cf. Jeffrey Masson, The Assault on Truth, 1984). Freud originally believed all of the stories of sexual abuse by fathers told him by his female patients and concluded that, "at the bottom of every case of hysteria there are one or more occurrences of premature sexual experience" ("The Aetiology of Hysteria" 263). Freud later changed his mind concerning the factuality of his patients' accounts, but, although the rapes may have been fantasy rather than reality, their clinical value remained the same for Freud. When Pointsman discovers that there appears to be no one-to-one correspondence between the stars on Slothrop's map and the women the stars are supposed to represent, he has to do some fast talking:

And what if many--even if most--of the Slothropian stars are proved, some distant day, to refer to sexual fantasies instead of real events? This would hardly invalidate our approach, any more than it did young Sigmund Freud's, back there in old Vienna, facing a similar violation of probability--all those Papi-has-raped-me stories, which might have been lies evidentially, but were certainly the truth clinically. (316)

The parable is double-edged: Pointsman is undermined in his attempt to find a causal, physiological basis for behaviour by his appeal to a non-physiological authority, and at the same time it is suggested that truth is not reached solely through empirical evidence. Brian McHale makes a similar point in rebuttal of John Gardner's criticism:

just because Pynchon plays fast and loose with his facts, projecting patterns well in excess of what those facts will sustain, does not mean that there may not be an element of truth in his paranoid fantasies....Granted that Gravity's Rainbow is at best a distorting lens, and not the clear pane of glass, transparent to things-as-they are, which Gardner seems to require; nevertheless, we regularly use distorting lenses to correct our distorted natural vision, one astigmatism cancelling out the other. (37)

Pynchon's "multiplication of effect" ("Is It O.K. to be a Luddite?" 40) may distort the significance and pervasiveness of humanity's death instinct, but he does so in dialectical counterpoint to the tyranny of perceived reality.

Because death is such an integral part of the novel, it will be useful to summarize some of the theory to which Pynchon is indebted or allied. The basis for most of the speculation engaged in by Marcuse and Brown is the work of Sigmund Freud, and especially Beyond the Pleasure Principle (BPP), and Civilization and Its Discontents (CD). Freud believed that "what decides the purpose of life is simply the programme of the pleasure principle" (CD 263), that the goal of the individual is to achieve and maintain happiness. However, as a civilized animal, the individual must make concessions to the society: the pursuit of individual happiness is qualified and limited by the constraints and laws of the society. Thus there is a basic conflict between the individual and the society and "what we call our civilization is largely responsible for our misery" (CD 274). The conflict is immediately apparent in Gra-

vity's Rainbow: the primary conflict in the novel is that between Slothrop's sexual exploits, his pursuit of happiness, and the interests of the status quo as represented by Pointsman. Pointsman claims scientific objectivity, but it is hard to miss the moralizing tone in his voice as he searches for a causal link: "What does make the little doxies do it for free?" (99). Of course, there are many benefits gained by the individual in exchange for submission, but, notes Freud,

the subjugation of the forces of nature, which is the fulfillment of a longing that goes back thousands of years, has not increased the amount of pleasurable satisfaction which they may expect from life and has not made them feel happier. (CD 276)

Freud is joined by Ellul in stressing that the majority of ameliorations that society has brought to the individual have been necessitated by the previous gifts of society:

Every successive technique has appeared because the ones which preceded it rendered necessary the ones which followed. Otherwise they would have been inefficacious and would not have been able to deliver their maximum yield. (116)

In other words, the "subjugation of the forces of nature" is not carried out for the benefit of the individual, but is, rather, the program of technique. Freud calls our enjoyment of technological advances "cheap" and compares it to that "obtained by putting a bare leg from under the bedclothes on a cold winter night and drawing it in again" (CD 276).

Today, the conflict between the individual and society, ra-

ther than having been resolved by the growth of civilization, is as strong as it was in the primal situations Freud posited as the origins of civilization. The individual continues to be thwarted in the pursuit of happiness dictated by the Pleasure Principle, and the benefits of the technological society may in fact be largely illusory.

For Freud, the primal situation at the root of civilization was the rebellion of the sons against the arbitrary rule of the despotic patriarch: "the totemic culture is based on the restrictions which the sons had to impose on one another in order to keep this new state of affairs in being" (CD 290). Thus far there is no conflict in the society; it is bound together by the complementary principles of Eros (love) and Ananke (the necessity of unity and hierarchy in the interest of maintaining the autonomy of the group) (290). However, such an arrangement necessarily involves the dynamics of dominance and submission--in a word, aggression. Dominance is sustained by the act or threat of aggression. If love and necessity were the only dynamics at work in the primal situation posited by Freud, there would have been no need to overthrow the father in the first place. Freud concluded from his observations of individual patients and the world in general, with apparent resignation, that "it is clearly not easy for men to give up the satisfaction of this inclination to aggression. They do not feel comfortable

without it" (CD 304-5). If the price of freedom is eternal vigilance, the price of dominance is eternal aggression. Pynchon exemplifies the omnipresence of this conflict in a peculiar passage of Gravity's Rainbow in which a teen-aged Slothrop is transported to a futuristic "factory-state" where he experiences relentless aggression:

Unexpectedly, this country is pleasant, yes, once inside it, quite pleasant after all. Even though there is a villain here, serious as death. It is this typical American teenager's own Father, trying episode after episode to kill his son. And the kid knows it. Imagine that. So far he's managed to escape his father's daily little death-plots--but nobody has said he has to keep escaping. (785)

Here the conflict is reversed: the father, wary of being overthrown, is like the priest at Nemi described by Frazer in The Golden Bough:

In this sacred grove there grew a certain tree round which at any time of the day, and probably far into the night, a grim figure might be seen to prowl. In his hand he carried a drawn sword, and he kept peering warily about him as if at every instant he expected to be set upon by an enemy. He was a priest and a murderer; and the man for whom he looked was sooner or later to murder him and hold the priesthood in his stead. (1)

Frazer describes a cycle of dominance and submission (death is the ultimate in enforced submission), but Pynchon indicates sustained aggression by the patriarchal figure. Interestingly, there is no indication that the aggression is reciprocated, but rather merely submitted to. If death is regarded as the ultimate submission (cf. Wimpe's analysis of control: "The basic problem...has always been getting other

people to die for you" [818]), then the conflict between Tyrone and Broderick can be projected as the model of contemporary society in which the status quo exacts continuous submission through aggression and the threat of aggression.

There is a definite link in psychoanalytic theory between aggression and the death instinct, but to understand this link, we shall need first of all to explore Freud's ideas concerning the beginnings of the death instinct in the individual. Freud posited that, at the origin of life, a "tension" occurred "in what had hitherto been an inanimate substance endeavour[ing] to cancel itself out" (BPP 32). Freud maintained consistently throughout his writings the identity of this "tension" with the individual's urge to self-destruction or the death instinct--the desire "to do away with life once more and to reestablish the inorganic state" (New Introductory Lectures 32: 140). Freud's words give new importance to Laszlo Jamf's spring lecture:

"You have two choices," Jamf cried, his last lecture of the year..."stay behind with carbon and hydrogen, take your lunch-bucket in to the works every morning with the faceless droves who can't wait to get in out of the sunlight or move be-yond...move beyond life, toward the inorganic. Here is no frailty, no mortality--here is Strength, and the Timeless." (675-6)

Jamf's lecture contains all that is negative and all that is positive in the death instinct. Science is represented as aggressive, as discarding life in favour of the inorganic, as embracing death. On the other hand, Jamf's vision seems

to have enormous vitality and appeal for himself and his students, seeming to sum up their collective yearning which is, in the narrator's words,

toward a form of death that could be demonstrated to hold joy and defiance, nothing of bourgeois Goetzkian death, of self-deluding, mature acceptance, relatives in the parlor, knowing faces the children can always read.... (675)

Death and joy are here associated: it is death that makes life worth living. Freud makes a similar observation in "Thoughts for the Times on War and Death," written during the First World War: "Life is impoverished, it loses in interest, when the highest stake in the game of living, life itself, may not be risked" (78-9). Freud goes on to indict all of us for "living psychologically beyond our means" (89), in that our attitudes towards death repress its inevitability.

Brown expands on Freud's ideas, declaring that "the repressed death instinct cannot affirm life by affirming death; life, being repressed, cannot affirm death and therefore must fly from death" (Life Against Death [LAD] 103). Brown follows Freud with the assertion that:

aggressiveness represents a fusion of the life instinct with the death instinct, a fusion which saves the organism from the innate self-destructive tendency of the death instinct by extroverting it, a desire to kill replacing the desire to die. (LAD 101)

Brown, however, goes further than Freud by making the repression of death the essential human trait--that which dif-

ferentiates us from other animals: "Animals let death be a part of life, and use the death instinct to die: man aggressively builds immortal cultures and makes history in order to fight death" (LAD 101). In Brown's view, the very structure of society, with its supporting religions and histories, ensures that the death instinct on the individual level is repressed. In contrast, Freud wrote, in Civilization and Its Discontents, that "civilization is a process in the service of Eros, whose purpose is to combine single human individuals, and after that families, then races, peoples and nations, into one great unity, the unity of mankind" (313). The tendency of the death instinct is exactly opposite to that of Eros: the death instinct undermines the civilizing influence of Eros, striving instead for greater individuality (CD 313-14). As Brown expresses it:

The principle of unification or interdependence sustains the immortal life of the species and the mortal life of the individual; the principle of separation or independence gives the individual his individuality and ensures his death.
(LAD 105)

Thus the importance for society of the repression of the death instinct: the consciousness of death amongst the individuals of society is subversive to the general program of society. But, "if death gives life individuality and if man is the organism which represses death, then man is the organism which represses his own individuality" (LAD 105).

The wartime setting of Gravity's Rainbow pro-

vides Pynchon with a unique opportunity to explore the nature of the death instinct. In "Thoughts for the Times on War and Death," Freud wrote that:

It is evident that war is bound to sweep away [the] conventional treatment of death. Death will no longer be denied; we are forced to believe in it. People really die; and no longer one by one, but many, often tens of thousands, in a single day....Life has, indeed, become interesting again; it has recovered its full content. (80)

Many, if not most, of the characters in Gravity's Rainbow rely in some way on the war, and consequently on the death instinct, for their livelihood and individuality. Of these, Roger Mexico is the most striking illustration of the death instinct's impact on the individual's quality of life. When Roger meets Jessica, she calls him a "little boy" and asks "Does your mother know you're out like this?" (44). Roger's physical and emotional immaturity are emphasized by his boyish appearance, but his answer to Jessica's question is even more telling: "My mother is the war" (44). Roger owes his being, inasmuch as it is identical with his individuality, to the war. As the narrator says,

And the war, well she is Roger's mother, she's leached at all the soft, the vulnerable inclusions of hope and praise scattered, beneath the mica-dazzle, through Roger's mineral, grave-marker self, washed it all moaning away on her gray tide. Six years now, always just in sight, just where he can see her. He's forgotten his first corpse, or when he first saw someone living die. That's how long it's been going on. Most of his life, it seems. (45)

Roger seems to be too much aware of death and, at "The White

Visitation," he is known as the "Dour Young Man" (45). However, if the war is Roger's mother, he has somewhat of an Oedipal fascination with it. It is only while the rockets are falling that he and Jessica can enjoy their extremely physical love (732). They have used the continuous consciousness of death to enhance their ability to live:

If they have not quite seceded from war's state, at least they've found the beginnings of gentle withdrawal...there's never been the space to talk about it, and perhaps no need--but both know, clearly, its better together, snuggled in, than back out in the paper, fires, khaki, steel of the Home Front. (47)

They have regressed away from the larger society into an erotic unity of their own in the face of ever-present death. It is significant, I think, that when Roger loses Jessica, he strikes out not specifically at her or at her fiancé, Beaver, but at the status quo in general as represented by the rich guests at a dinner party (832ff). "He has to choose between his life and his death" (832), and he chooses not to repress his death instinct. He and Bodine unleash a barrage of crudities that mix food and decay, life and death, stressing the mortality and corruption of each individual at the table.

Of Freud's ideas concerning the death instinct, it is the opposition between dominance and submission that Marcuse seizes upon and applies to contemporary society. Freud acknowledges that the two instincts, Eros and death,

"seldom --perhaps never--appear in isolation from each other, but are alloyed with each other in varying and very different proportions" (CD 310). The instincts are thus open to a dialectical interpretation, having no distinct boundaries or essences. Freud further proposes that,

In sadism, long since known to us as a component instinct of sexuality, we should have before us a particularly strong alloy of this kind between trends of love and the destructive instinct; while its counterpart, masochism, would be a union between destructiveness directed inwards and sexuality. (CD 310)

Brown gives no consideration to sadism and masochism in Life Against Death, but this omission is hardly surprising when one considers his theme of innocent, infantile, "polymorphous perverse" love (LAD 27) as the panacea for the world's ills. Marcuse, on the other hand, takes the dominance and submission motif inherent in sadism and masochism and makes it one of the linchpins of his argument.

Marcuse's book, Eros and Civilization, is a discussion of the possibility of a "non-repressive" civilization. Marcuse's assertion is that "the most effective subjugation and destruction of man by man takes place at the height of civilization, when the material and intellectual attainments of mankind seem to allow the creation of a truly free world" (4). Freud believed that repression was necessary to the peaceful functioning of society (CD 284), but Marcuse differentiates between the repression necessary to hold the social fabric together and "surplus-repression" defined as

"the restrictions necessitated by social domination" (35). In Marcuse's view, Freud took a fatalistic position concerning the need for repression and submission to the Reality Principle because:

to him, there was no higher rationality against which the prevailing one could be measured...and if the abolition of domination destroys culture itself, then it remains the supreme crime, and no effective means for its prevention are irrational. (80)

Marcuse, however, regards Freud's perspective as a "specific historical organization of human existence" (5), and uses the term "performance principle" (35) to describe that historical form that prevails at the moment.

In Gravity's Rainbow, Marcuse's ideas find expression in the voice of Thanatz (whose name puns on the Freudian term for the death instinct, Thanatos). Thanatz professes "Sado-anarchism," his theory of the possibility of a non-repressive society. His critique of the repressive society is similar to Marcuse's. His seduction of Ludwig is begun with the claim that "a little S and M never hurt anybody." Ludwig's reply, "Who said that?" is an immediate appeal for the safety of submission to authority. Thanatz replies,

Sigmund Freud. How do I know? But why are we taught to feel reflexive shame whenever the subject comes up? Why will the Structure allow every other kind of sexual behavior but that one? Because submission and dominance are resources it needs for its very survival. They cannot be wasted in private sex. In any kind of

sex. It needs our submission so that it may remain in power. It needs our lusts after dominance so that it can co-opt us into its own power game. There is no joy in it, only power. I tell you, if S and M could be established at the family level, the State would wither away. (859-60)

Thanatz's theory is anarchy in that it favours a decentralization of power from the state to the family level, a regression from the unifying, civilizing force of Eros, and a lifting of the surplus-repression of the death instinct. Thanatz does not accept the given reality of reflexive shame as the only possibility, but rather attributes it to the prevailing "Structure," the performance principle.

It is the same performance principle that is active in Mexico's perception of the "Home Front": "the Home Front is something of a fiction and lie, designed, not too subtly, to draw them [himself and Jessica] apart, to subvert love in favour of work, abstraction, required pain, bitter death" (47). The "bitter death" cited here is a reference to the official culture of death, of the fear of death that Roger and Jessica have withdrawn from: "They are in love. Fuck the war" (47). To understand the death instinct is to come to terms with your own mortality and to be aware of the transience of human affairs. Roger is aware, but not complacent. He is afraid of losing Jessica to the "Structure," the War: "You're catching the War. It's infecting you and I don't know how to keep it away" (207). He makes the connection between the performance principle, the War, and the

repressed sexuality of Jessica's "official" relationship with Beaver:

Damned Beaver/Jeremy is the War, he is every assertion the fucking War has ever made--that we are meant for work and government, for austerity: and these shall take priority over love, dreams, the spirit, the senses and the other second-class trivia that are found among the idle and mindless hours of the day... (206)

Mexico and Thanatz both come to conclusions similar to those of Marcuse concerning the relativity and repressiveness of the status quo, and in so doing, illustrate something of Pynchon's mode of argument. The two characters come from different backgrounds, nations and sexual orientations. Pynchon constructs two different scenarios with different vocabularies that lead in approximately the same direction, thus achieving the "multiplication of effect" of which he writes in "Is it O.K. to Be a Luddite?" (40). The accumulation of different scenarios in different terms acts almost subliminally to give the reader impressions of ideas that promote intellectual uneasiness rather than the easy dismissal a coherent theory would permit.

Thanatz also raises the idea of "reflexive shame." Guilt is an important component of Freud's perception of civilization, and an idea which Brown explores at great length. In Civilization and Its Discontents, Freud writes as "the final conclusion of our investigation" that "the price we pay for our advance in civilization is a loss of happiness through the heightening of the sense of guilt"

(327). Aggression, according to Freud, is curbed by the superego in the form of conscience; it is "introjected, internalized; it is, in point of fact, sent back to where it came from--that is, it is directed towards [the] ego" (CD 315). In this way, civilization is imposed:

Civilization, therefore, obtains mastery over the individual's dangerous desire for aggression by weakening and disarming it and by setting up an agency within him to watch over it, like a garrison in a conquered city. (CD 316)

Pynchon makes a similar, though more paranoid, statement of civilization's use of the superego:

The Man has a branch office in each of our brains, his corporate emblem is a white albatross, each local rep has a cover known as the Ego, and their mission in this world is Bad Shit. We do know what's going on, and we let it go on. As long as we can see them, stare at them, those massively moneyed, once in a while. As long as they allow us a glimpse, however rarely. We need that. (831)

Pynchon's restatement of Freud's concept of the superego contains some interesting associations. He uses a business paradigm (mixed with hints of espionage) to describe the workings of the superego, but it is easy to turn the paradigm around and see the function of the superego in business. Brown says that "the psychology of economics is the psychology of guilt" (LAD 266), and, in Gravity's Rainbow, Phoebus (the light bulb cartel) illustrates Pynchon's awareness of Brown's contention:

Phoebus discovered--one of the great undiscovered discoveries of our time--that consumers need to

feel a sense of sin. That guilt, in the proper invisible hands, is a most powerful weapon. (759)

Guilt, as a weapon, is an instrument through which civilization exercises control over the individual.

Guilt, however, would not be such an effective weapon if Puritan civilization had not already conditioned the need on the part of the individual for a "sense of sin." The sense of guilt, says Freud, "expresses itself as a need for punishment" (CD 316). The consumer needs to be made to feel sinful in order that payment, or expiation be encouraged. The act of paying, writes Pynchon, is "the primal American act" (705), and the idea of payment is "the damned Calvinist insanity" (66). Gerhardt von Göll (der Springer), a black-marketeer with no conscience, puts the economics of guilt into terms of preterition and election:

Despise me, exalt them, but remember, we define each other. Elite and preterite, we move through a cosmic design of darkness and light, and in all humility, I am one of the very few who can comprehend it in toto. Consider honestly therefore, young man, which side you would rather be on.
(577)

The mutual dependence of the elect and the preterite is also expressed in William Slothrop's tract "On Preterition," in which he "argued holiness for these 'second sheep,' without whom there'd be no elect" (647). It is easy to speak of domination by society while forgetting that dominance requires an equal amount of submission.

The Herero are portrayed as perennial victims in

Gravity's Rainbow (and in V. as well). The psycho-analytic correlation between blackness and feces is well-known and is summarized by Treacle, Gravity's Rainbow's resident Freudian:

He had not meant to offend sensibilities, only to show the others, decent fellows all, that their feelings about blackness were tied to feelings about shit, and feelings about shit to feelings about putrefaction and death. It seemed to him so clear...why wouldn't they listen? (321)

Various characters in the novel use the Schwarzkommando as scapegoats for society's guilt. Slothrop has been sent, unwittingly, to aid in the destruction of the Herero (717). Tcitcherine hunts his black halfbrother, Enzian, because of a "compulsive need he has given up trying to understand, a need to annihilate the Schwarzkommando and his mythical half-brother, Enzian" (393). Perhaps Tcitcherine, a hero who ignores the possibility of death, wishes to erase the black side of himself which reminds him of death and putrefaction. Brown notes that "the morbid attempt to get away from the body can only result in a morbid fascination...in the death of the body" (LAD 294). Tcitcherine's obsession can thus be seen as a denial of his own mortality (and preterition). The hunting of the Herero seems redundant in light of their program of racial suicide. They become an embodiment of the death instinct, seeking the "final zero" of the inorganic state (371).

Weissmann (Blicero), who formed the Schwarzkommando,

and whose name means, literally, white man, is the purest representative of the death instinct in the novel. His association with the Herero may also be seen as an attempt to fill a void left by the general Western repression of the physical body and mortality. He is fascinated by death and most especially by his own:

"Want the Change," Rilke said, "O be inspired by the flame!" To laurel, to nightingale, to wind... wanting it, to be taken, to embrace, to fall toward the flame growing to fill all the senses and...not to love because it was no longer possible to act...but to be helplessly in a condition of love... (112)

The death instinct affirms life, but the general repression of the death instinct results in the repression of life as well: the two instincts must affirm each other, but in repressive civilization, they cannot and we risk annihilation (Brown, LAD 113). Marcuse calls this the "fatal dialectic of civilization" (54). Weissmann suffers from the repression of life and love, and as a result wills his annihilation, in order to "fill all the senses," to experience the best of life. Blicero, Katje, and Gottfried (God's peace) act out the "Hansel and Gretel" fairy tale to the point where they are all poised before the oven waiting for the end when either the witch or the child must be baked. Blicero's S and M play seems to reflect his desire to consume life and to be consumed by it.

All of these manifestations of the death instinct require the kind of mediation I have been giving them in

order to be coherent, but these readings are far from exhaustive. Psychoanalytical criticism at its best is dialectic and thus never-ending, and Pynchon gives very little help in formulating easy interpretations. He is more likely to hinder such efforts by "multiplication of effect." There is, for instance, a wealth of allusions in the novel to Jung and his work with Nordic mythology (cf. N. F. George, "The Chymische Hochzeit of Thomas Pynchon," Pynchon Notes 4 [October 1980]). Pynchon's multiplicitous treatment of the death instinct is more open to an investigation of the writer's style and mode of argument than it is to any definitive reading of the death instinct itself. In On the Genealogy of Morals, Nietzsche comments on the contents of his earlier work, Human, All-Too-Human:

I made opportune and inopportune reference to the propositions of that book [Paul Ree's The Origin of the Moral Sensations], not in order to refute them--what have I to do with refutations!--but, as becomes a positive spirit, to replace the improbable with the more probable, possibly one error with another. (18)

Nietzsche does not concern himself with empirically derived facts or eternal verities, but rather with the "more probable," the more subjective, intuitive. The genealogical approach that Nietzsche takes is described by Michel Foucault in his article, "Nietzsche, Genealogy, History:"

[Genealogy] must record the singularity of events outside of any monotonous finality; it must seek them in the most unpromising places, in what we tend to feel is without history--in sentiments,

love, conscience, instincts; it must be sensitive to their recurrence, not in order to trace the gradual curve of their evolution, but to isolate the different scenes where they engaged in different roles. (139-40)

Foucault's description of genealogical study could be applied to Pynchon's treatment of the death instinct in Gravity's Rainbow. Death lurks everywhere in the novel, but is seldom or never reducible to a formula, whether Freud's, Marcuse's, or Brown's. Every character has a different angle, and every scene shows death in a new aspect, a new role. The reader once more becomes a sorting demon looking for consistency where perhaps the only valid message is to be found in the labyrinthine multiplicity of impressions.

CONCLUSION

When one is writing on Gravity's Rainbow, one is perhaps tempted to write an extrication rather than a conclusion, and my conclusion must be somewhat of a disclaimer in any case. The multiplicity of Pynchon's novel makes the finding of theoretical patterns extremely difficult and is perhaps fatal to any real hope of reaching conclusions. The ironic disregard which Pynchon seems to have for theory is displayed graphically in an episode that highlights one of the more important aspects of Brown's work. In Life Against Death, Brown writes that:

the pattern of normal adult sexuality (in Freud's terminology, genital organization) is a tyranny of one component in infantile sexuality, a tyranny which suppresses some of the other components altogether and subordinates the rest to itself.
(27)

To end this "tyranny", Brown calls for a return to the "polymorphous" perversity of infantile sexuality (27). Pynchon takes note of the problem in a passage in which Lyle Bland notes that "there was not enough genital obsession" among American males and that this deficiency "was undermining the efficiency of the organs doing the real work" (677). However, Brown's solution is the subject of satire in the passage already cited in which Säure compares Rossini and Beethoven. Säure exclaims that "the World is rushing

together" (513), and describes Webern's music as an "an expansion of music's polymorphous perversity till all notes were equal at last" (514). He and Gustav go on arguing about whether or not the golden age of universal love, as reflected in music, is about to dawn until the "Berlin police supported by American MPs in an adviser status" burst in to arrest them all (516). The effect of Pynchon's satire is to show the final inseparability of theory and practice, metaphysics and physics.

Having noted the limitations of the approach I have taken, I must still emphasize my conviction that Gravity's Rainbow is both an historical document in its use of the popular philosophies of the sixties, and a justification of the spirit of the philosophers who proclaimed them. Pynchon's use of theory concerning paradigms, entropy, technique, behaviourism, and psychoanalysis captures much of the counter-cultural Zeitgeist that made the sixties such an interesting and disturbing time. In Gravity's Rainbow the often neglected works of Ellul, Marcuse, and Brown are artistically realized in a form that does not allow the reader to easily dismiss any idea. Pynchon projects a dark world which is essentially the negative of their optimism. The result, however, is not pessimism, but optimism qualified by the reality that inspires and necessitates it.

NOTES

¹Saturday Review, qtd. in Thomas Pynchon, Gravity's Rainbow (New York: Bantam Books, 1980) iii.

²Marquette Tribune, qtd. in Pynchon Notes 6 (June 1981): 44.

³John Keats, "Lamia," English Romantic Writers, ed. David Perkins (New York: Harcourt Brace Jovanovich, Inc., 1967) 1196.

⁴Robert K. Merton, foreword, The Technological Society, by Jacques Ellul, trans. John Wilkinson (New York: Vintage Books, 1964) vi.

⁵Imre Lakatos, qtd. in "From Paradigms to Research Programs: Toward a Post-Kuhnian Political Science," in Theory-Building and Data Analysis in the Social Sciences, H. B. Asher, et al. (Knoxville: University of Tennessee Press, 1984) 23.

⁶Reported by Jeremy Campbell, Grammatical Man: Information, Entropy, Language, and Life (New York: Simon & Schuster, Inc., 1982) 32.

⁷George Bull, intro., The Prince, Niccoló Machiavelli, George Bull, tran. (Harmondsworth: Penguin Books Ltd, 1981) 23.

BIBLIOGRAPHY

Primary:

- Pynchon, Thomas. The Crying of Lot 49. Toronto: Bantam Books, 1982.
- . Gravity's Rainbow. Toronto: Bantam Books, 1980.
- . Slow Learner. Toronto: Bantam Books, 1985.
- . "Is It O.K. to Be a Luddite?" New York Times Book Review. (Oct. 28, 1984).
- . V. Toronto: Bantam Books, 1981.

Secondary:

- Abernethy, Peter L. "Entropy in Pynchon's The Crying of Lot 49." Critique 14,2 (1972): 18-33.
- Ball, Terence. "From Paradigms to Research Programs: Toward a Post-Kuhnian Political Science." Theory-Building and Data Analysis in the Social Sciences. Ed. H. B. Asher, et al. Knoxville: University of Tennessee Press, 1984. 23-49.
- Barrett, William. The Illusion of Technique: A Search for Meaning in a Technological Civilization. Garden City, New York: Anchor Press/Doubleday, 1979.
- Berthoff, Warner. A Literature without Qualities: American Writing Since 1945. Berkeley: University of California Press, 1979.
- Bettelheim, Bruno. The Uses of Enchantment: The Meaning and Importance of Fairy Tales. New York: Vintage Books, 1977.
- Brecht, Bertholt. Mother Courage: A Chronicle of the Thirty Years' War. Tran. Eric Bentley. The Modern Theatre. Vol.2. Ed. Eric Bentley. Garden City, New York: Doubleday Anchor Books,

1955.

- Brown, Norman O. Life Against Death: The Psychoanalytical Meaning of History. Middletown, Connecticut: Wesleyan University Press, 1977.
- . Love's Body. New York: Random House, 1966.
- Burroughs, William S. Naked Lunch. New York: Grove Press, Inc., 1981.
- Campbell, Jeremy. Grammatical Man: Information, Entropy, Language, and Life. New York: Simon and Schuster, Inc., 1982.
- Clausewitz, Carl von. On War. Ed., tran. Michael Howard, Peter Paret. Princeton, New Jersey: Princeton University Press, 1976.
- Crews, Frederick. Out of My System: Psychoanalysis, Ideology, and Critical Method. New York: Oxford University Press, 1975.
- Eddington, Sir Arthur. The Nature of the Physical World. London: J. M. Dent & Sons Ltd, 1955.
- Ellul, Jacques. The Technological Society. Tran. John Wilkinson. Introduction, Robert K. Merton. New York: Vintage Books, 1964.
- Fish, Stanley. Is There a Text in This Class?: The Authority of Interpretive Communities. Cambridge, Massachusetts: Harvard University Press, 1980.
- Foucault, Michel. "Nietzsche, Genealogy, History." Language, Counter-Memory, Practice: Selected Essays and Interviews. Ed. Donald F. Bouchard Tran. Donald F. Bouchard et.al. Ithaca, New York: Cornell University Press, 1981.
- Frazier, Sir James George. The Golden Bough: A Study in Magic and Religion. Abridged. London: Macmillan Press, 1983.
- Freud, Sigmund. Beyond the Pleasure Principle. Tran., ed. James Strachey. International Psycho-Analytical Library 4. New York: Liveright Publishing Corporation, 1961.
- . Civilization and Its Discontents. The Pelican

Freud Library 12. Tran., ed. James Strachey.
Harmondsworth: Penguin Books Ltd, 1985.

- . New Introductory Lectures on Psychoanalysis.
Tran. James Strachey. Ed. James Strachey et.al.
The Pelican Freud Library 2. Harmondsworth:
Penguin Books Ltd, 1981.
- . "Thoughts for the Times on War and Death." The
Pelican Freud Library 2. Tran., ed. James Strachey.
Harmondsworth: Penguin Books Ltd, 1985. 57-89.
- . "Why War." The Pelican Freud Library 2. Tran., ed.
James Strachey. Harmondsworth: Penguin Books Ltd,
1985. 341-362.
- Gardner, John. On Moral Fiction. New York: Basic
Books, Inc., 1978.
- George, N. F. "The Chymische Hochzeit of Thomas
Pynchon." Pynchon Notes 4 (Oct. 1980): 5-22.
- Kuhn, Thomas S. The Structure of Scientific Revolu-
tions. International Encyclopedia of Unified
Science II:2. Chicago: University of Chicago
Press, 1970.
- Lovejoy, Arthur O. The Great Chain of Being: A Study
of the History of an Idea. Cambridge,
Massachusetts: Harvard University Press, 1978.
- Machiavelli, Niccoló. The Prince. Tran., introduction
George Bull. Harmondsworth: Penguin Books Ltd,
1981.
- Mangel, Anne. "Maxwell's Demon, entropy, information:
The Crying of Lot 49." Tri-Quarterly 20
(Winter 1971):194-208.
- Marcuse, Herbert. Eros and Civilization: A Philosophi-
cal Inquiry into Freud. Boston: The Beacon Pre
Press,1956.
- . One-Dimensional Man: Studies in the Ideology of
Advanced Industrial Society. Boston: Beacon
Press, 1966.
- Marquette Tribune. Qtd. in Pynchon Notes 6 (June
1981): 44.
- Masson, Jeffrey Moustaiieff. The Assault on Truth:

- Freud's Suppression of the Seduction Theory.
Toronto: Collins Publishers, 1984.
- McHale, Brian. "On Moral Fiction: One Use of Gravity's Rainbow." Pynchon Notes 6 (June 1981): 34-8.
- Meshner, David R. "Negative Entropy and the Form of Gravity's Rainbow." Research Studies 49:3 (Sept. 1981): 162-170.
- Nietzsche, Friedrich. On the Genealogy of Morals. Tran. Walter Kaufmann et al. Ed. Walter Kaufmann. New York: Vintage Books, 1969.
- Rifkin, Jeremy et.al. Entropy: A New World View. Toronto: Bantam Books, 1981.
- Roszak, Theodore. The Making of a Counter Culture: Reflections on the Technocratic Society and Its Youthful Opposition. Garden City, New York: Doubleday & Company, Inc., 1969.
- Sanders, Scott. "Pynchon's Paranoid History." Twentieth Century Literature 21:2 (May 1975): 177-192.
- Siegel, Jules. "Who Is Thomas Pynchon...And Why Did He Take Off With My Wife?" Playboy 24:3 (March 1977): 97, 122, 168-74.
- Skinner, B. F. Beyond Freedom and Dignity. Toronto: Bantam Books, 1972.
- . Walden Two. New York: Macmillan Publishing Co., Inc., 1962.
- Tanner, Tony. Thomas Pynchon. Contemporary Writers. Ed. Malcolm Bradbury et.al. London: Methuen & Co. Ltd, 1982.
- Thorburn, David. "A Dissent on Pynchon." Commentary 56 (Sept. 1973): 68-70.
- Vesterman, William. "Pynchon's Poetry." Twentieth Century Literature 21:2 (1975): 211-20.
- Wiener, Nirbert. The Human Use of Human Beings: Cybernetics and Society. Garden City, New York: Doubleday & Company, Inc., 1954.

Willey, Basil. The Eighteenth Century Background:
Studies in the Idea of Nature in the Thought
of the Period. Boston: Beacon Press, 1961.

Wolfley, Lawrence C. "Repression's Rainbow: The Presence
of Norman O. Brown in Pynchon's Big Novel."
PMLA 92:5 (Oct. 1977) 874-87.