

Entropy in Pynchon's "Entropy" and Lefebvre's The Production of Space

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Volume 3 Issue 4 (December 2001) Article 5**Jason Snart,****"Entropy in Pynchon's 'Entropy' and Lefebvre's *The Production of Space*"**<<http://docs.lib.purdue.edu/clcweb/vol3/iss4/5>>

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Abstract: In his paper, "Entropy in Pynchon's 'Entropy' and Lefebvre's *The Production of Space*," Jason Snart examines Thomas Pynchon's short story "Entropy" for the ways in which it deals with the kinds of disorder(s) associated with entropy as a thermodynamic and informational concept. Those concepts are installed as a framework within which to consider cultural studies work like Henri Lefebvre's thought in his *The Production of Space* and Ludwig von Bertalanffy's general systems theory and thermodynamics: disorder is rendered not as confusion, but rather as a state of potential energy and productivity and Lefebvre's and Bertalanffy's concepts serve to show how disorder can inform critical work.

Jason SNART

Disorder and Entropy in Pynchon's "Entropy" and Lefebvre's *The Production of Space*

The notion of disorder -- although more generally understood in its colloquial sense of disorganization or even chaos (*Webster's* offers "want of order; confusion" 116) -- is borrowed here from information studies and from thermodynamic theory. I engage thermodynamics as a conceptual system with cultural relevance, following in the work by such pioneers in systems science as Ludwig von Bertalanffy, who formulated the theory that general systems, including thermodynamic systems just as much as cultural systems, can be self-regulating; that is, the energy flow of an open system tends towards a steady state, corresponding to a minimum of entropy production, and thus stabilizing the system (see Bertalanffy 1968). It is my purpose to examine Thomas Pynchon's short story "Entropy" for the ways in which it deals with the kinds of disorder(s) involved in entropy as a thermodynamic and informational concept, and to suggest an application of those concepts to critical activity such that disorder need not be seen as a state of confusion, but rather as a state of potential energy and productivity. It is this latter extension that dislodges the present work from the growing body of scholarship that treats entropy in work by Pynchon. I analyze Henri Lefebvre's *The Production of Space* as an example of how disorder can inform critical work, for Lefebvre's work invites and manages a certain level of disorder for specific purposes. Disorder in Lefebvre's thought is to work against the political and ideological effects of ordering in systemic projects, not least of those being late capitalism as Lefebvre identifies it. Rather than practice a traditional sort of reading of Pynchon *through* chaos theory, or Pynchon *through* Lefebvre, or even Lefebvre *through* Pynchon, I hope to bring each of these matters together such that they all gloss each other but none takes a central, final, controlling place.

In response to an assertion by Bernard-Henri Lévy that at certain points during the critical process one would experience "the time to stop, the moment of reflection and regaining equilibrium" (120), Michel Foucault invoked what he called "the moment of new mobility and new displacement" (120). As is clear from Foucault's assertion and from others in the same interview, he is not interested in a resting point for critical work and inquiry to gather and order itself. The mobility he calls for is to be part of any critical project, for it keeps such projects from falling into dogmatic kinds of closure (at which point they operate to flatten difference, not to explore it). What seems to characterize many of the most persistent critical projects (in both broad and specific terms) is what Peter Hitchcock has called "restless inquiry" (3). Both Foucault and Hitchcock point to a recurrent theme in many critical formulations, although it is defined in various ways: mobility, movement, displacement, or, as I call it here, "disorder." I introduce the notion of disorder in the very specific terms laid out by information and thermodynamic theory, wherein it connotes a state of potential or choice (in information) and movement or energy (in thermodynamics). As the working term in this essay, disorder is meant to evoke that recurrent theme of mobility or restlessness. And it is meant to reflect a potentially positive force, not, as is too often the case, a state of confusion or breakdown. To bring terms from chaos theory into play is not simply to replace one set of terms (like mobility or restlessness) with another; rather, it is to suggest that through such a recasting we can see similarities in otherwise nominally distinct subjects (like Pynchon and Lefebvre) and also expand the conceptual framework itself by suggesting and/or pursuing further implications. For example, if the concept of immobility is cast as heat death (a term I engage below), and we know that order and disorder are deeply connected (in the scientific sense) with heat death, then we might expand the conceptual framework to consider how order and disorder can also speak beyond their scientific roots.

While some of the terms I engage are from non-literary fields, my focus here is on how these terms are instantiated in Pynchon's short story, "Entropy." First published in the *Kenyon Review* in 1960, in "Entropy" two simultaneous story lines occur in two clearly separate, though related, spaces. Judith Chambers and David Seed note that the organizing principal is like a "musical fugue" (Chambers 24; Seed 50). In one apartment, Meatball Mulligan throws a "lease-breaking party" (Pynchon 41). In an apartment immediately above, Callisto and Aubade, in their "hermetically sealed ... enclave of regularity" keep to themselves and never go out (83-84). Set up as op-

posites, these two scenes reflect Pynchon's exploration of entropy and the story itself reflects what Chambers has called "the theme of decline in his [Pynchon's] early stories" (1). Pynchon also explores the concept of entropy in detail in his novels, including *The Crying of Lot 49* and *Gravity's Rainbow*, as many critics have noted. I consciously limit my discussion to Pynchon's "Entropy," since his novels receive the lion's share of academic attention. A different project could certainly trace parallels between Pynchon's novels and short stories. For example, Christian Moraru shows how "human agency collapses" in *Gravity's Rainbow* as individual lives are circumscribed by the technology they serve (that should serve them) (265). As I hope to show, "Entropy" navigates the problem of human agency when the possibility for action abuts entropic listlessness on one hand and the entirely random on the other (or as Moraru calls them in a different context, "the binary structures of inert and alive, static and dynamic" [267]).

The point of the present essay is to engage Pynchon's story in a critical reading somewhat on its own terms. In drawing from information and thermodynamic theory, I am trying to show how Pynchon's story can show us disorder functioning in daily life (although, as Christian Moraru writes of *Gravity's Rainbow*, Pynchon's text does not "illustrate" anything ... [it] delineates [themes] fictionally" [265]). The differences being one of thematic control and limitation versus thematic extension.) Pynchon's characters, I argue, are unsuccessful in their personal endeavors to combat the existential malaise that has settled over them, owing to their misreading (or mis-use) of disorder. Chambers notes that the reactions that Pynchon's characters have to "fear, primarily fear of death" are in some ways "antithetical," yet are in other ways "the same, ineffectual response: withdrawal and escape" (25). However, where Pynchon's characters fail, I show how we might learn a valuable lesson in recognizing disorder and conceptualizing it in a productive and energizing manner. From Pynchon's "Entropy" I read to the critical work of Henri Lefebvre, specifically *The Production of Space*. Within that very difficult work is the implicit (and often explicit) call for critical mobility and openness. *The Production of Space* is, itself, an example of "disorder" as it can inform a critical text. In his book, Lefebvre suggests that capitalism's weakness, its potential openness to critical readings, might be the spatial chaos that unintentionally develops (or can be made to appear through critical work), even while capitalism tries to compose and contain itself as a controlled (controllable) and ordered (ordering) mode of production and reproduction. Spatial chaos (or spatial chaoses, for they are often micro in scale) occur, for Lefebvre, in the seams between centres. If Deleuze and Guattari are correct in describing the power of capitalism's overcoding machine (its self-presentation) as the "organization of a resonance among centers" (211), then we can perhaps imagine Lefebvre's spatial chaos as breakdowns in those resonances. Paul Virilio describes the same kind of flattening of difference. In *A Landscape of Events*, Virilio notes that "hyper-speed" renders impossible the "time necessary for reflection" (96). And in *The Information Bomb*, Virilio argues for the role of "speed and concentration" in the emergence of "centralized," yet "globalized," capital and culture (11, 13). "Grand-Scale Transhorizon Optics," Virilio writes, make "globalitarianism" possible, which in turn makes possible "totalitarianisms" of the future, just as it allowed for those of the past (15, 18). In many ways, Virilio is extending Horkheimer and Adorno's argument for the power of culture (the dominating culture industry) to impress "the same stamp on everything" (*Dialectic of Enlightenment* 120). Virilio, working in and towards a different era, locates cultural power very differently than do Adorno and Horkheimer, yet each identifies the cultural drive toward "total accomplishment" which flattens difference (*Information Bomb* 18)

In the face of flattened difference, or the stamp of sameness, it is up to critical readers and writers to *find* chaos, or disorder. Thus we must be aware of disorder as a potentially productive concept, even when its so-called "common sense" valence would suggest otherwise (that is, would suggest disorder as a negative condition, one connoting break-down, loss of control, and inefficiency). I cast Lefebvre's fairly general use of "chaos" as a concept rooted in more strictly scientific terms, allowing us to explore more concretely what chaos can actually mean in critical thinking. I read Pynchon's "Entropy" as a lesson in how disorder can exist, but also as a warning against its mis-use, for Pynchon's short story elaborates the entropy concept (deeply connected to chaos theory through order and disorder as states in a system) without straying very far from the scientific bounds of the term. Pynchon's short story also offers a more manageable presentation of the gen-

eral entropy theme which appears in many of his other, much more difficult and lengthy works. For example, Alan W. Brownlie argues that *The Crying of Lot 49* and *Gravity's Rainbow* "present the possibility that power [in the form of social control] can be redistributed" (1). Entropy figures more or less explicitly in these works as the condition which prevents such redistribution, since there is no energy available to initiate change. Oedipa Maas, in *The Crying of Lot 49*, arrives to San Narciso, in southern California, to find a scene of entropic stasis: "Nothing was happening." She looks down onto "The ordered swirl of houses and streets" and remembers the first time she saw a "printed circuit" (24). Oedipa senses something meaningful, some "intent to communicate"; however, meaning seems to be suppressed by the outward hyper-orderliness of her surroundings (24). As many of Pynchon's characters must, Oedipa attempts to navigate the space between meaningful communication and entropic, monologic, order.

Entropy can be defined in a number of different ways, which is partly why it is so useful a concept to relate otherwise localized contexts; even in the natural and medical sciences, it speaks across a number of disciplinary lines. Louis de Broglie, a physicist who received the Nobel Prize for showing how particles can behave like waves, said, "Nothing is more misleading than a clear and distinct idea" (128). The clear and distinct idea no doubt represents an immobility within a body of knowledge whereby the potential for change or growth is suppressed. Thus Broglie and Foucault, thinkers from diverse fields, seem to be expressing a conceptually similar theme in their concern for immobility. As A.B. Çambel points out in *Applied Chaos Theory* (1993), there are many "entropies" and his definitions include "the ability to reach equilibrium," "a measure of chaos," or "an indication of transmitting information" (130-31). N. Katherine Hayles in *Chaos Bound* (1990) calls entropy a "statistical measure of disorder," yet "so rich in significance is the statistical view of entropy that its full implications are still being explored" (42). Webster's *New Compact Dictionary* gives us something slightly different: "entropy: ... measure of the unavailable energy of a system: an ultimate state of inert uniformity" (135). Entropy in thermodynamic systems measures, in one sense, the disorder of bodies in a system. Molecules (bodies) in a cup of tea are considered disordered if you've just poured milk in. There are pockets of "hot" and "cold" molecules; that is, molecules with more or less energy. But the cup will tend towards uniformity (a process aided by your stirring) in which energy passes from areas of hot to areas of cold; entropy increases. Finally, the cup of tea reaches, more or less, a state of uniform heat distribution, at which point entropy is high, since the disorderly molecules have become ordered. In terms of disorder and entropy, the measure is inverse: Low disorder ---> high entropy ---> uniformity. Heat death, a concept tied to entropy, is when the universe has run out of energy, in that its particles (molecules, if you like) have reached a state of completely uniform distribution. There are no differences which can generate energy (or generate energy transfer since, technically, energy is never created). True or total "heat death" does not really happen in the tea cup because it is not a perfectly closed system. The tea is in contact with the cup which is in contact with your hand, the air, etc. But for the purposes of the model, heat death is that point at which the system has reached thermodynamic uniformity and there is no energy available unless it comes from "outside" the system (you add more hot water or cold milk or you spill the whole cup in your lap, in which case there is a sudden burst of energy).

Disorder in information theory is slightly different since it is a measure, not of bodies, but of immaterial potential. Hayles offers useful examples of this in her book *Chaos Bound* (e.g., 52-53). Imagine I am communicating to you a three letter word (which we can call a message): -- -- --. None of the letters are given. This we might imagine as a state of randomness (not to be confused with chaos) wherein almost any combinations of letters could be put in place to form a recognizable word. There are, in fact, a finite number of possibilities so it is not truly random, but for our purposes, the message is at least meaningless. But what if I give you some of the letters. For example A X --. The message to be sent is clearly A X E, as no other letters will fit the space and make sense; in fact, "ax" is an accepted alternative spelling for "axe." Thus the number of possible forms the message can take is low; the entropy is high, since entropy is actually an inverse measure of potential. But next imagine that instead of giving you A X --, I give you A -- E. The number of possible forms the message can take is much higher; the message, as is, seems disor-

dered (noisy), and entropy is low. Notice that low entropy in both thermodynamic and information systems connotes a state of disorderliness (or unpredictability), or, put more positively, potential. Any number of letters might be inserted to create a meaningful word -- AXE, ATE, ACE, ARE. So we might say that entropy is lowest when message potential is greatest, save in the cases where so little information is present as to render the system essentially random. If there is a heat death in information systems it clearly comes at that point when no disorder remains, and all messages are perfectly communicated but completely closed. Heat death in information systems occurs at the same conceptual moment as it does in thermodynamic systems: when entropy reaches maximum. Clearly, in some cases, perfect (or noiseless) communication is ideal. But the point here is to suggest the political implications of the more general assumption that disorder is unwanted and detrimental in all cases. Applying Bertalanffy's thought of thermodynamics and systems theory, Lefebvre's work stands as the example of productive disorder: Lefebvre theorizes disorder as he practices it and considers its ideological implications.

What if cultural products like the present paper are a type of message in which, for simplicity's sake, "I" am communicating with "you." If I were to provide a random assortment of lines and scribbles we would have no message at all and, therefore, no measure of entropy could be made. At the other extreme we have a sort of metaphoric heat death whereby my thinking has become so systematized and so dogmatic, I am closing intellectual doors instead of opening them: in Hayles's example, I simply give you A X E. Certainly that trend in critical work away from moments of immobility can be cast here as a fear of heat death: the absence of energy and potential. The larger metaphor of chaos theory works, I hope, in pointing to the productive potential in certain instances of disorder (noise, complexity). For the present paper, I cast the scientific concept of entropy as one applicable to cultural studies. That is, critique requires a certain energy, although often the subject of critique (industry, capital, media, etc.) presents itself as so highly ordered, so clear and distinct, as to make critical work extremely difficult. Often, critical reading depends upon a kind of disordering of existent orders. Entropy provides us, conceptually, with a way of seeing disorder as productive and full of potential, especially in terms of providing energy for developing new ways of thinking about things, and of counteracting the deeply political effects of intellectual, or critical, heat death: the point at which critique is no longer possible because the energy which drives it is nonexistent; in some cases, our subjects of study become so well ordered as to be impenetrable and unreadable. Pynchon imagines a heat death in his short story "Entropy" in which the events in two locations are contrasted: Meatball Mulligan's lease-breaking party in one apartment and Callisto and Aubade's sealed hothouse in the apartment directly above (83). Elements of order, disorder, and entropy function in each location. The setting is Washington, D.C. in 1957 (John Stark notes that Washington "adds a low-key political dimension" to the story [20]). Meatball's apartment represents a site open to the outside world, a site of high disorder: a girl passed out in the sink, friend Saul breaking into Meatball's place through the window, three co-eds from George Washington, later, five enlisted personnel of the U.S. Navy. And all of this just arriving to a party that is going into its second day. In contrast to Meatball's "open" party is Callisto and Aubade's place directly above: the enclave of regularity, "alien to the vagaries of the weather, of national politics, of any civil disorder ... They did not go out" (83-84). They did not go out because they could not go out; both Callisto and Aubade had become a part of the delicate balance of the apartment's regularity -- its closed system. Ironically, Callisto's greatest fear is the "heat death" he thinks is happening outside the apartment. The thermometer has read 37 for days on end, suggesting to Callisto (who knows just enough about entropy to be concerned) that "galaxy, engine, human being, culture, whatever" would each wind itself down to heat death (87). Chambers suggests that Callisto's is "at least a thoughtful attempt to make order out of chaos" (28). However, it is unclear as to why Callisto would try to combat the "heat-death for his culture" by creating a closed system of his apartment (88). I must stress here that I do not take Callisto's misunderstanding of entropy to indicate any misunderstanding on Pynchon's part; clearly, Pynchon wants us to see Callisto's reaction to entropy as mis-guided because misinformed. John Stark notes that "the inability of [Pynchon's] characters to understand, much less control, cause-and-effect relationships continually thwarts them" (9). Indeed, Callisto says the apartment is to keep

the "city's chaos" at bay (83). He believes in his ability to control cause and effect; as readers, we can clearly see this belief to be misguided however. The constant outside temperature (which does not suggest chaos at all) seems to be enough omen of impending heat death for Callisto and Aubade -- add to this Callisto's sketchy understanding of entropy -- and Callisto is convinced that all is winding down towards heat death.

In Meatball's lease-breaking party and in Callisto and Aubade's closed-system apartment, Pynchon offers two apparently opposing reactions against the spiritual or cultural malaise (never well defined) that has stricken at least these people in 1957 Washington. However, Pynchon's exploration of entropy is not only in terms of thermodynamics. He introduces entropy in its informational sense, also by contrasts between the two apartment settings. Callisto tries to "communicate ... life" into a dying bird which he cradles in his arms. Pynchon is clearly mixing his entropies here in having both informational and thermodynamic senses at play (97). The point is perhaps to show Callisto's confused sense of how entropy functions; this would also explain his attempt to seal the city's chaos out from a closed apartment, all the while expecting heat death outside but not inside. What Callisto and Aubade ultimately find, however, is that the uniformity of their own apartment, its thermodynamic heat death, makes it impossible for Callisto to save the bird, since he cannot transfer, or communicate, any warmth to it. Callisto protests, "I held him ... to give him the warmth of my body ... What has happened? Has the transfer of heat ceased to work? Is there no more" (97-98). For Callisto and Aubade, there is no more. The chaos of Meatball's party, with its many bodies coming and going, is meant to suggest motion in the sense of thermodynamics, activity and energy, however disorganized (or random) it might be. However, Meatball and his good friend Saul enter into a conversation on information theory amidst the party's chaos: "[Saul:] ... Tell a girl: 'I love you.' No trouble with two-thirds of that, it's a closed-circuit. Just you and she. But that nasty four-letter word in the middle, that's the one you have to look out for. Ambiguity, redundancy, irrelevance, even. Leakage. All this is noise. Noise screws up your signal, makes for disorganization in the circuit" (90-91). Meatball gives up in the face of unavoidable open-ness in communicating messages, and retires to the closet with a bottle of tequila as his apartment is destroyed by the continuing party. Ironically, Meatball and Saul label disorder, in terms of information theory (noise, leakage, ambiguity), as problematic, while at the same time they are allowing an unmanageable level of disorder into the apartment, seemingly as a way to combat what they seem to feel is their otherwise uniform or bland existence.

Pynchon himself admits that his story is somewhat heavy handed in its dependence on entropy as a theme -- a fact which is all too clear in some of the conversations that go on between Meatball and Saul, or between Callisto and Aubade, in which characters speak on the subject of entropy as though delivering rehearsed textbook lectures. This, actually, benefits my purpose here since Pynchon never strays too far from entropy as a concept with specific, scientific roots; however, the point remains that in each of the two apartment scenes there is a sense that the uniformity and decline of the outside world needs somehow to be combatted. For Meatball et al. it means a lease-breaking party: the invitation of energy (in whatever form they can find it) into their lives. For Callisto and Aubade it means sealing themselves off from the world outside. Neither attempt is successful however: "For Aubade, suddenly then, as if seeing the single and unavoidable conclusion to all this she moved swiftly to the window ... tore away the drapes and smashed out the glass ... and turned to face the man on the bed and wait with him [Callisto] until the moment of equilibrium was reached ... their separate lives should resolve into a tonic of darkness and the final absence of all motion" (98). Aubade already sees the "uniform darkening gray" sky as portent to universal heat death. The sky is proof of a world winding down into what Callisto has described as a "Condition of the More Probable": heat death (87). Then, as life winds down for Callisto and Aubade, Meatball Mulligan's party turns anarchic and ugly: In the kitchen two of the girls from George Washington and the sailors were singing Let's All Go Down and Piss on the Forrestal. There was a two-handed, bilingual morra game on over by the icebox. Saul had filled several paper bags with water and was sitting on the fire escape dropping them on passersby in the street. A fat government girl in a Bennington sweatshirt, recently engaged to an ensign attached to the Forrestal, came charging into the kitchen, head lowered, and butted Slab [on of the Navy personnel] in the

stomach. Figuring this was as good an excuse for a fight as any, Slab's buddies piled in. The morra players were nose-to-nose, screaming *trois*, *sette* at the tops of their lungs. From the shower the girl Meatball had taken out of the sink announced that she was drowning. She had apparently sat on the drain and the water was now up to her neck" (96). To cap this manic paragraph, Pynchon writes, "The noise in Meatball's apartment had reached a sustained, ungodly crescendo" (96). On the one hand we have the total absence of energy in Callisto and Aubade's place. And on the other we have the anarchy and random violence (an unmanageable excess of energy) that Meatball's party becomes.

In both cases, excesses in the thermodynamic sense, coupled with breakdowns in the transfer of information entropy speaks across these disciplinary lines. Callisto cannot "communicate" warmth to the dying bird and Saul grieves the inevitable leakage, or noise, always present in communicating even a simple "I love you." While Pynchon himself dislikes the story for its "sombre glee at any idea of mass destruction and decline," it is an illuminating look at the various metaphoric ways in which heat deaths might occur and at how the concept of entropy can describe more than strictly scientific thermodynamic or information systems (13). What Pynchon's characters seem to either forget or never discover at all, is that certain kinds of leakage, or disorder, are necessary to keep from the cultural heat death that has descended (or which is descending) onto 1957 Washington. Unlike his characters, Pynchon, in Judith Chambers's reading, "rejects absolute despair, although perhaps not with the soundness that he refuses closure" (3). Callisto and Aubade (without seeming to realize it) need disorder in their sealed environment to enable heat transfer (expressed by Pynchon as much in informational as thermodynamic terms) from Callisto to the bird. We can read the closed system of Callisto and Aubade's apartment as a warning to Meatball and Saul of the dangers of communication without any leakage whatsoever. At the same time, Meatball's party represents the opposite: an uncontrolled openness (or nothing but leakage) which does not lead to any real change in the scene: only noise, and, we might presume, a lost security deposit and the hunt for a new apartment. In Pynchon's story, the ideas of entropy and disorder, and the complications of agency -- or of just being in the world -- intersect. It is from this intersection that I would like to extend my reading of Pynchon's short story into the space of cultural and critical work, such that we might confront disorder in its entropic senses, as a necessary part of that work. It is not a part to go un-theorized since (and this is the crucial lesson I learn from Pynchon) it is not a concept to which critical work can be completely open (Meatball's party) or completely closed (Callisto and Aubade's apartment). That is, to assert the potential productivity of disorder is not to say that, where once I took order to be good and disorder to be bad (whatever these values mean), I now take the inverse to be true: disorder is always good, and order is always bad. Clearly, things do not line up this way.

I now take the concept of entropy as Pynchon engages it and examine that same concept in terms of the critical work of Henri Lefebvre, specifically his *The Production of Space*, which uses concepts like chaos and entropy, although not in specifically scientific taxonomy. Lefebvre creates a certain degree of disorder within his work and the potential effects of that disorder on the reader, to which Lefebvre alludes, can become clearer, and, perhaps, more widely applicable, as I put them into the framework of specifically scientific disorder and entropy. It has been my purpose thus far to explore Pynchon's work for what it might teach us about entropy in information and thermodynamics and for its presentation of the material manifestations of entropy in daily existence. Here, I engage Lefebvre in such a way that these apparently very different works can be made to both illuminate each other and to inform critical practice. Lefebvre's 1974 work (not translated into English until 1991) reasserts "space" as both a social product and a social producer, despite the "strictly 'geometrical' meaning" space seemed, for Lefebvre, to have taken on throughout the development of Western philosophy (1). It should be mentioned that numerous other scholars such as Derek Gregory, Edward Soja, David Harvey, Mike Davis, and Fredric Jameson, for example, have also devoted considerable attention to spatiality but it is Lefebvre's work that provides a particularly good foothold in the present analysis because of his attention to disorder as a component of spatiality.

Lefebvre's form as much as his content speaks to the energizing effects a certain disorder can bring in keeping intellectual work from dogmatic closure and in destabilizing systemic projects (like structuralism or central planning) which require order, in the form of flattening difference, to function. Lefebvre develops a text which keeps itself resolutely open, mobile and disorderly. Indeed, his final chapter is titled "Openings and Conclusions," and his final line reads, "we are concerned with nothing that even remotely resembles a system" (423). Lefebvre introduces the general concepts of disorder and entropy as follows: "This is perhaps a convenient moment [textually and historically] ... to consider what has been happening in the second half of the twentieth century, the period to which 'we' are witness. The state is consolidating on a world scale. It weighs down on society (on all societies) in full force; it plans and organizes society 'rationally,' with the help of knowledge and technology, imposing analogous, if not homologous, measures irrespective of political ideology, historical background, or the class origins of those in power. The state crushes time by reducing differences to repetitions or circularities (dubbed 'equilibrium,' 'feedback,' 'self-regulation,' and so on) ... This modern state promotes and imposes itself as a stable centre -- definitively -- of (national) societies and spaces. As both the end and the meaning of history -- just as Hegel had forecast -- it flattens the social and 'cultural' spheres. It enforces a logic that puts an end to conflicts and contradictions. It neutralizes whatever resists it by castration or crushing. Is this social entropy? Whatever the answer, the results lie before us" (23). What Lefebvre calls the process of flattening is perhaps an apt description for what Pynchon's characters sense is happening to their own worlds and lives, although they never make that explicit. Certainly, Pynchon's characters feel social entropy increasing (see 88), provoking the contrasting responses we see in Meatball's apartment on the one hand, and Aubade and Callisto's hothouse apartment on the other. Lefebvre does not elaborate his own entropy metaphor in further scientific terms. But given my elaboration here, the answer to Lefebvre's question, "is this social entropy?" would clearly be yes. So how does Lefebvre avoid entropy within his own text? He works against the "logic that puts an end to conflicts and contradictions" in his formal approach and he introduces contradictions and slippages as a way of keeping a certain disorder in his work. That is, Lefebvre's argument(s) never seem to line up in any ordered way such that he can be easily abstracted or summarized. Edward Soja, explicating Lefebvre's work in *Thirdspace* (1996), calls its logic a "both/and also" logic which works against the binary logic of and/or choices and the closures they imply (3). Lefebvre's "radically open perspective," as Soja calls it, produces disorder, which itself arises from unresolved conflicts and contradictions (5). Lefebvre, like Meatball Mulligan, invites disorder; however, where Meatball lets disorder turn to sheer noise, Lefebvre's use of disorder is far more controlled. This is really to say that Lefebvre, as we might expect, has not produced a "random" argument. That is, the disorderly elements in his work function for reasons he has clearly theorized; he has not simply jumbled things up just to see if anything happens. Cause and effect still operate in Lefebvre's work; disorder is there for a reason. Chaos theory reminds us that even in chaotic systems cause and effect relationships are still in place, they may just not be linear. It is only in truly random systems that cause and effect cease to function. Lefebvre's use of disorder has the clear political and ideological aim to work against the dominance of orderly systems. Meatball or his crew have not at all thought through the implications of disorder as it might either ruin Meatball's apartment or potentially save him from social entropy. Callisto, arguably, has thought through the implications of entropy and disorder, however, his reaction to fight entropy outside by creating a closed system in his apartment is still somewhat confusing -- to say nothing of Aubade's position in the whole situation and whether Callisto ever thinks of her at all. Chambers writes that Aubade is "no more than an extension of Callisto's consciousness" (31).

Lefebvre's continuous reworking and re-presentation of material opens up a space of disorder within his work which is perhaps meant to mirror the spatial chaos "engendered by capitalism" (63). Chaos is, in a sense, capitalism's mistake: an unwanted element of its controlled production; through the conceptual framework developed here, I would argue that chaos is capitalism's Achilles' heel in the sense that it allows energy for an active, critical agency (which is not to say that capitalism does not promote a sort of internal energy, often coded as chaos, in which change and progress justify production of the "new." Although as Jacques Attali, and Deleuze and Guattari,

especially note: controlled "chaos" as part of the system produces only repetition and reproduces the system all over again). In fact, it is transparent readability that capitalism wants. Yet, "It turns out on close examination that spaces made (produced) to be read are the most deceptive and tricked-up imaginable ... [produced space] says what it wishes to say -- yet it hides a good deal more" (143). Finding disorder and spatial chaos is to reveal that which is hidden. The reason Lefebvre opens perspectives and returns to ideas over and over again is to avoid an immediate readability, or transparency, in his own work: an aim which seems at odds with the rationality of clear communication, yet which is immediately in line with keeping his anti-systemic theorizing from becoming, itself, a system. He wants of the reader a close examination, which is exactly what is required in the "reading" of capitalist space. Lefebvre is making a call (by requiring in his own text) a reading strategy which can manage disorder, and then find within that disorder potential energy for critical reading and developing new ideas beyond those Lefebvre himself offers directly. Soja, on the structure of Lefebvre's text, writes that "he may not have intended *The Production of Space* to be read as a conventional academic text, with arguments developed in a neat linear sequence from beginning to middle to end ... perhaps Lefebvre was presenting *The Production of Space* as a musical composition ... a polyphonic fugue that assertively introduced its keynote themes early on and then changed them intentionally in contrapuntal variations that took radically different forms and harmonies" (8-9). What Soja hears in Lefebvre's work is the impulse to (re)create that space between total noise and clear, but closed, signal instead of giving over to the temporal line of "beginning ... middle ... end" in which the process of creation is a process of completion or containment. Lefebvre has no interest in the contained message; but, rather, he works in that space of creative thinking and imagining, in which what might come is far more interesting than what has already come. Soja continues on Lefebvre's work's structure: "the fugue formed some protection for Lefebvre against the canonization of his ideas into rigidly authoritative protocols" (9).

Overlapping tripartite structures, for example, are key to the proliferating perspectives Lefebvre opens up. For example, he introduces spatial practice, representations of space and representational spaces as three parts in a "conceptual triad ... to which we will be returning over and over again" (33). The triad returns later, although it is complicated by a second triad: perceived, conceived and lived spaces (38). Spatial practice is that space of the perceived, representations of space are those of the conceived, and representational spaces are those of the lived. Each part of each triad is distinct from, yet involved with, each other part. *The Production of Space* is, in many ways, a continuous reworking of these triads whereby definitions change with each context. In this way, Lefebvre can begin to construct his science of space without ever slipping into reductive generalizations, which for him signal the conceptual uniformity beyond which critique is no longer possible and from which nothing else can be learned. In his final paragraph, Lefebvre recalls the recurring tripartite series of perceived, conceived and lived spaces, though here they describe the kind of orientation Lefebvre is looking for, not the spaces he is exploring. The perceived-conceived-lived triad appears in modified form, neither completely like nor completely different from its earlier uses, forcing the reader, even as the author concludes, to assimilate this variation on the theme. The very use of the tri-partite structures, in which any combination of two is always complicated by another term, suggests Lefebvre's concern with the easy simplicity with which binary opposites can be used to order and classify, and which gird the dominant logic Lefebvre is trying to work against. The danger of order, especially in the form of transparency and immediate readability, is made clear by Lefebvre: "signs and surfaces also manage to conjure away both *possibility* and time" (143; my emphasis). And further, "Sight and seeing, which in the Western tradition once epitomized intelligibility, have turned into a trap: the means whereby, in social space, diversity may be simulated and a travesty of enlightenment and intelligibility ensconced under the sign of transparency" (76). By bringing certain of Lefebvre's own metaphors of chaos and entropy back to their more strictly scientific roots, we can see how disorder functions in his work as a way of creating possibility, just as in the scientific models disorder in thermodynamic and information systems can connote a state of energy and potential. And heat death, or maximum entropy, in the thermodynamic and informational senses, describes the state at which there is no energy available

for further work and no potential for new or different information to be transmitted: the condition of rigid systematization and order.

Part of my project here is to avoid formulations of disorder as problematic noise or confusion by introducing chaos theory as a body of knowledge which sees disorder as a condition of potential energy and possibility. Specifically, through the concept of entropy, I suggest a way of thinking with and in disorder. Pynchon's concept of entropy speaks to entropy as a cultural phenomenon, not just as a term limited to informational and thermodynamic systems. His short story delineates the entropy concept as it is made material beyond its scientific basis, although not so far abstracted from that basis as to lose all connection with it. Meatball Mulligan, and Callisto and Aubade, each react to their senses of social or cultural entropy. In Meatball's lease-breaking party we see disorder as energy allowed into the apartment/system, whereas in Callisto and Aubade's apartment we find the order of the closed system. In each case, though, these thermodynamic systems are informational systems as well, in which communication becomes more difficult due either to an excess of disorder or an excess of order. I make the connection from Pynchon's representation of disorder and entropy made material in the lives of his characters, seemingly caught in entropic systems they cannot fully understand or manage, to Lefebvre's *The Production of Space*. Lefebvre's critical reassertion of space as central to understanding and critiquing modern culture and the culture industry invokes a certain disorder in its formal manipulation of ideas, such that it demands readers confront that disorder. His final line is worth returning to: "And we are concerned with nothing that even remotely resembles a system" (423). Lefebvre's concern for the potential systematizing of his own ideas suggests the root cause for his use of disorder. By reading Lefebvre's disorder in the very specific terminology of information studies and thermodynamic systems and as glossed by Pynchon's imaginative extension of entropy materialized in the lives of his characters, we can gain greater appreciation for the deep effects disorder and entropy can have for daily existence and for the critical work which looks to study and affect change in that existence. Through the theories of thermodynamics and the information sciences, I read Lefebvre's text as disorderly in the very specific sense of having energy and potential. In my reading through these concepts, we see how otherwise disparate subjects can speak to and illuminate one another; as well, we can, I hope, see how disorder can be conceptualized such that it need not always connote a condition of confusion, deterioration, or breakdown, and such that local disorders, even in very disparate contexts, can be seen to share something in common.

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