

Rereading Pynchon:
Negative Entropy and "Entropy"

Stephen P. Schuber

Since its publication in 1960, Thomas Pynchon's short story "Entropy"¹ has been situated within critical attempts to read Pynchon's novels as literary articulations of the thermodynamic principle of entropy. Indeed, entropy and related issues are so thoroughly embedded in Pynchon criticism that an exhaustive index of "entropic" readings might closely approximate a list of some of the most frequently cited responses to his fiction.² Typical of such approaches is William M. Plater's comment that Pynchon "examines the philosophical world as if it were a closed system in which facts, rather than molecules, are distributed according to the laws of thermodynamics" (1). Similarly, Tony Tanner states that "Thomas Pynchon made his intentions clear from the outset. The title of his first important short story is 'Entropy' and . . . his work is certainly about a world succumbing to entropy . . ." (153). Peter Bischoff generalizes: "When Thomas Pynchon gave the title 'Entropy' to his second published short story, he furnished . . . the key for the interpretation of this story which is programmatic for his entire work."³ Anne Mangel agrees in regarding entropy as the basic principle informing Pynchon's narrative technique: "Pynchon's use of scientific concepts and disorder in his fiction holds a dual excitement, for not only does it sever him from a previous, more rigid and static kind of writing, but it also links him with contemporary artists working in other media who incorporate scientific ideas and seek randomness in their art" (207-08). Such statements assert rather than demonstrate randomness, and ultimately lend support to Gore Vidal's dismissive comment that "The imaginative writer can never be serious unless, like Mr. Thomas Pynchon, he makes it clear that he is writing about Entropy and the Second Law of Thermodynamics and a number of other subjects that he picked up in his freshman year at Cornell."⁴

Still, critics often agree with Tanner that Pynchon "is the plotter of a growing disarray" (180), and that

entropy is a metaphor of the deterioration of modern life.⁵ Yet it is precisely in such a fashion that many readers miss crucial points about both entropy and Pynchon's use of this concept, for entropy, properly understood, is a more complex and vital notion than is generally recognized. The basis for critical misapprehensions is a popular confusion of entropies. In the first place, there is the scientific concept which obtains, for example, in physics, chemistry, biology, and information theory. Second, there is a less scientifically defined, metaphorical entropy, the tenor of which is "growing disarray," in Tanner's words. Third, associated with the first two entropies is the notion of negative entropy, the scientific component of which is less widely recognized, and whose metaphorical ramifications have usually been ignored in critical discourse concerning Pynchon.⁶ Before this variety of entropies can usefully be applied to Pynchon's early story, however, some definitions must be clarified.

Entropy is generally defined as a measure of disorder within a closed system; the concept of disorder is a familiar one to critics, but too few have taken into account the notion of a closed system. Norbert Wiener, a pioneer in the field of cybernetics, is often cited for his famous discussions of entropy and communication; many are familiar with his observations that "a system may lose order and regularity spontaneously, but . . . it practically never gains it. . . . [A] message can lose order spontaneously in the act of transmission, but cannot gain it."⁷ As Wiener points out, statistical knowledge enables us to specify that "in an isolated system, the probability that the entropy shall decrease is zero" (22, my emphasis; cf. Ch. 2). This means simply that in a closed system, spontaneously generated higher orders of complexity are not to be anticipated, and are, in fact, statistically impossible. Similar considerations of probability attend information theory. As Wiener points out, a "message is a transmitted pattern, which acquires its meaning by being a selection from a large number of possible patterns. . . . [The] less probable a message is, the more meaning it carries . . ." (8). By following Claude Shannon's pioneering probability theories, the noted biologist Lila Gatlin observes that

the sequence {ATATATATAT . . .} is absolutely probable or predictable, and the information content of the sequence is thereby reduced;⁸ Wiener had made a similar point earlier (7-8), and Shannon himself observed that "the redundancy of ordinary English, not considering statistical structure over greater distances than about eight letters, is roughly 50%. This means that when we write English half of what we write is determined by the structure of the language and half is chosen freely" (cited by Mangel, 206). From the point of view of entropy, there is an a priori and severe limit on the new information conveyed by any utterance. In summary, then, entropy is a measure of decreasing differentiation and greater predictability within a closed system, biological or linguistic.

At this stage in the discussion concerning entropy, most critics adopt the concept as a metaphor for the futility of attempting to construct meanings, relationships, and human encounters in Pynchon's works. Tanner makes a specific equation: "These two phenomena--entropy and the dread of love--may well be linked in some way, for they show a parallel movement towards the state of lasting inanimateness, and share an aspiration to eradicate consciousness and revert to thing-status" (159). Love, of course, is never a simple given, but rather a state of higher valence, one requiring the figurative addition of energy; a lack of love is equivalent to metaphorical entropy or "inanimateness." The extreme human case of entropy, as Plater notes, is death (3). Finally, assumptions about the nature of entropy have led some critics to judgments concerning Pynchon's style; according to Mangel, "The redundancy, irrelevancy, ambiguity, and sheer waste involved in language glare from every page . . ." (206-07).

Thus the theories of entropy and critical metaphoric entropy seem to suggest that the world is running down in an inexorable process of decline; but we have not yet considered negative entropy. As Wiener also points out in his 1950 study, "Let us note that the assertion of the second law of thermodynamics is confined within narrow limits. The statement that we are dealing with an isolated or a substantially isolated [i.e., closed] system is of the essence. In the non-isolated [i.e.,

open] parts of an isolated system there will be regions in which the entropy . . . may well be seen to decrease. In this connection, the coupling which unites the different parts of the system into a single larger system will in general be both energetic and informational" (23). The limits to which Wiener refers are those of systems, and he draws several significant distinctions. Systems are defined by their relations with other systems. That is, some systems are relatively closed, others relatively open. In a closed system, entropy may well seem to increase; in open systems, on the contrary, one finds growth, development, and higher orders of complexity. Gatlin has made the same point in biological terms: "as higher organisms have evolved, their entropy has in some way declined because of their higher degree of organization," and she cites the physicist Schrödinger's dictum that life "feeds on negative entropy" (22).

Anthony Wilden makes the same point in this fashion: "Somewhere between the low order of systemic complexity of the energy relationship involved when two billiard balls strike each other, and the very high order of informational complexity when men [sic], nations, and ideas collide, we pass from the realm of closed systems to that of open systems, from the 'inorganic' to the 'organic.' In a later metaphoric emergence, we also pass from 'nature' to 'culture.'"⁹ In other words, negative entropy is not simply a mathematical concession that life may exist; rather, it is the acknowledgment of far greater possibilities--culture, for example--than those of narrowly entropic outlooks. Of central importance is Wiener's observation that open systems interact in "energetic and informational" fashions; while organization seems to be running down in some systems, a characteristic of life, as Wilden too suggests, is the ability to process information into higher orders. Nature may behave according to general rules such as those of the Second Law of Thermodynamics, but culture derives from the manipulation of information. Or as Gregory Bateson puts it, "The conservative laws for energy and matter concern substance rather than form. But mental process, ideas, communication, organization, differentiation, pattern, and so on, are matters of form rather than substance."¹⁰

21

Yet even on the level of "substance" and in terms of the most basic conditions for life, entropy is not actually the negative limit popularly imagined. An early prophet of what is here termed metaphoric entropy, Henry Adams, "calculated the running down of intellectual energy on earth [and predicted that] thought would reach the limits of its possibilities . . . in the year 1921."¹¹ Luckily for us, his entropic metaphor was mixed. Actually, the possibilities for organismic, negentropic development are far from limited in the conventional sense, for as Gatlin points out, life is dependent on DNA, and "since there are four kinds of DNA bases, over 4^{10^9} base sequences are possible for present-day organisms. This number is greater than the estimated number of particles in the universe" (4). In other words, statistically possible forms of life have an upper limit only because there is a theoretically finite number of elements in the universe.

Such speculations, however, are examples of what might be called metaphoric negentropy; it is obvious that the forms of life--or information--have been and continue to be limited. As has often been observed, it is statistically possible to generate a word in English, zaj, for example, but the simple possibility guarantees neither sense nor survival. As both Gatlin and Wilden point out, it is the interplay of constraints and freedom--entropy and negentropy--which governs the conditions of life and information theory (Gatlin, 35 ff. and passim; Wilden, Ch. XII and passim). In this light, we might recall Shannon's previously cited observation that only half of what we write in English "is chosen freely." Far from being a pessimistic statement of metaphoric entropy, Shannon's comment is simply an acknowledgment that if we wish to make sense in English, we may not write zaj: constraints and freedoms interact in life as well as in information theory. Similar observations and considerations obtain in Pynchon's story "Entropy"; far from being a simple statement of decay or metaphoric entropy, the story highlights the more fundamental problems of freedom and constraint.

Appropriately, then, "Entropy" is divided between two settings: Meatball Mulligan's party downstairs, and Callisto's "hermetically sealed" (279) hothouse apartment located directly above. Meatball's party

has been in progress for forty hours, and Meatball himself is asleep during the introductory scene, which focuses less on the chaos of the party than on background information. Above, Callisto lives in a world apart, musing, as had Henry Adams, on Thermodynamics with a capital T. This upstairs/downstairs division cannot, as shall become clear, be taken simply as a contrast of higher and lower levels of organization.

Meatball's party is composed of "a lot of American expatriates" who "would stage, for instance, polyglot parties where the newcomer was sort of ignored if he couldn't carry on simultaneous conversations in three or four languages" (277, 278). Of course, a certain irony attends the pretensions of such a group, but at the same time one must note a striving for plurality, novelty, unpredictability, and new information. Most notable among Meatball's partygoers is a jazz group, the Duke di Angelis quartet. Not only do they smoke pot and wear sunglasses, but they also operate on a jazzed-up non-linear scale; granted, they embody bohemian clichés of 1957, but they also serve as a nexus for sound and wind metaphors in the story. While the quartet listens to The Heroes' Gate at Kiev, Meatball's "party seemed to be gathering its second wind. Outside there was rain. . . . The day before, it had snowed and the day before that there had been winds of gale force and before that the sun had made the city glitter bright . . ." (278). The narrator moves from the jazz quartet to the weather and thence to a generalization, based on etymology: "as every good Romantic knows, the soul (spiritus, rauch, pneuma) is nothing, substantially, but air; it is only natural that warpings in the atmosphere should be recapitulated in those who breathe it" (278). Thus the reader encounters several variations on the theme of air, many of which entail uncertainties beyond that of etymological accuracy: from jazz (non-linear sounds in air), to weather (changeable air), to a sub-routine equating soul and air (explained by sounds--moving air), positing a similarity between all these forms of moving air and people's actions.¹²

The transition from Meatball's party to Callisto's hothouse is moving air, "the last bass notes of The

Heroes' Gate," which awakes Callisto in his "hothouse jungle, . . . a tiny enclave of regularity in the city's chaos, alien to the vagaries of the weather" (279). The hot air of Meatball's party gives way to Callisto's hothouse, and one is tempted to equate the former with simple randomness, and the latter with controlled order. But as any reader of late 19th-century literature knows, the hothouse is a favorite trope of the Decadents, a sort of locus amoenus which is a temporary refuge from a debased, disordered civilization. Yet for the Decadents, escape is only temporary; Callisto's problem is more complex, but still analogous: "Through trial-and-error [note the stochastic process] Callisto had perfected its [his hothouse's] ecological balance . . . so that the swayings of its plant life, the stirrings of its birds and human inhabitants were all as integral as the rhythms of a perfectly-executed mobile" (279). For both the Decadents and Callisto, escape and separation carry the penalty of absolute predictability; both reach the pendulous--and perilous--states of "perfectly-executed mobile[s]," self-contained or closed systems susceptible to, but resisting outside influences. Or more precisely, the closed system of the mobile conserves balance only when outside interferences--movements of air--are kept below a certain threshold.

Meatball is similarly subject to thresholds; by "that last cymbal crash" he "was hurled wincing into consciousness . . ." (280). Like Callisto, Meatball is subject to the movements of air, and similarly he awakens to a cadence, spelled here with a lower-case d. While the "final hiss" of the sound which awakened him "remained for an instant in the room, then melted into the whisper of rain outside" (280), Meatball refuses a joint and crawls into the kitchen for some tequila. He opens a window, the first of the important window images in the story, to admit Saul, who will later discourse on the failure of information theory; watches three coeds majoring in Philosophy enter his apartment; and somewhat later sees five sailors "all in various stages of abomination" enter his apartment, thinking it is "the hoorhouse that chief was telling us about" (287). Such a confusion of events, from the

hothouse to the hoorhouse, seems to signal a decadence too much noise for successful or effective communication at Meatball's party.

Again, it might seem that Callisto's world represents a neatly ordered universe, while Meatball's is one of disintegration. After all, Callisto dictates his reflections on entropy and broods over the apparently constant outside temperature of 37°; meanwhile Meatball seems to misunderstand Saul's discourse on information theory. However, it is a mistake to assume that Callisto is losing a battle to the forces of entropy, represented by his measurements of temperature and by contrast with Meatball's seeming disorganization. More accurately, Callisto is perpetuating an entropic situation, and Meatball is ordering a potentially negentropic state.

Callisto in fact avoids new information; his dictations about entropy are but memories of things past--theories he imposes on the present from his isolated perspective. He recalls that "The cosmologists had predicted an eventual heat-death for the universe . . . the meteorologists, day-to-day, staved it off by contradicting with a reassuring array of varied temperatures" (280). The reader has already been informed about previous changes in the weather: wind, rain, snow, gales, and sunshine. Perhaps the weather reports are, as so often in Pynchon's works, simply more plots. Or perhaps Callisto is so enclosed in his own thoughts that he can never measure more than 37°: "Leery at omens of apocalypse, Callisto shifted beneath the covers" (280); he never moves from his bed, nor does he ever escape his ideas of entropy. He never himself ventures to check his appropriated theories against external reality, and thus is trapped not by entropy, but by his essentially subjective pessimism.

Callisto is an entropic island, insulated from larger systems; everything he needs in his hothouse is delivered from outside (279). Even his companion, Aubade, is distanced from him: before the reader learns her name, she is referred to three times simply as "the girl" while she "lay like a tawny question mark facing" Callisto (279). She is French and Anna-

mese, which has led Joseph W. Slade to speculate that Pynchon "may be hinting at exploitation by a technological colonialism."¹³ Aubade is certainly described in such terms; not only is she "obedient" (280), but she also takes dictation and until the end of the story performs for Callisto those functions which he cannot execute without leaving his bed. Clearly Callisto drains energy; for all his musings about entropy and heat death, he does very little himself, but rather relies on outside forces to support him. His one act of human decency, holding a sick bird, is a failure: "'I held him [the bird] . . . to give him the warmth of my body. Almost as if I were communicating life to him, or a sense of life" (292). There is, first of all, quite a difference between life and a sense of life; the latter is a more closed system than the former. Second, Callisto's entropic sense of heat is not the same as life. Finally, the limits of Callisto's entropic framework blind him to a variety of possible ways of saving the bird; all he can believe in his paranoid self-enclosure is that the bird needs heat.

Callisto's musings are similar to Saul's downstairs lectures on information theory. Saul's wife has just left him; as he explains, "'It seems she is, as we say, bugged at this idea of computers acting like people. I made the mistake of saying you can just as well turn that around, and talk about human behavior like a program fed into an IBM machine" (285). Saul's comments on entropy in information theory include the usual jargon: "'Ambiguity. Redundance. Irrelevance, even. All this is noise. Noise screws up your signal, makes for disorganization in the circuit'" (285). Both Callisto and Saul are immobilized; in the face of scientific and metaphoric entropy, neither is capable of initiating a negentropic action. Callisto cannot move in order to seek outside help for the bird, and Saul is similarly lethargic, hiding behind theories; as he opines, "'You find I think that most "successful" marriages . . . are sort of founded on compromises. You never run at top efficiency, usually all you have is a minimum basis for a workable thing. I believe the phrase is Togetherness'" (286). But the word "Togetherness," even with a capital T, is so predict-

able that, like Shannon's {ATATATAT . . .} sequence, it conveys no information. While Callisto and Saul, in their separate ways, seem to be aware of the debilitating forms of entropy, neither one advances to a new form of energetic or informational activity.

Callisto and Saul have another parallel in the Duke di Angelis Quartet. Meatball observes them "going through the motions of a group having a session, only without instruments" (289). They explain that they are escaping "root chords. Nothing to listen to while you blow a horizontal line. What one does in such a case is, one thinks the roots"; as the Quartet becomes more and more self-enclosed, "a horrified awareness was dawning on Meatball. 'And the next logical extension,' he said. 'Is to think everything,' Duke announced . . ." (290). The group mimics interaction; at least they claim they are counting bars and paying attention to keys, but when they begin to "play" again, they are going back to what they call "the airless void" (290). Their actions are so restricted that, like Callisto and Saul, they constitute hermetically sealed systems which, because they are incapable of information-sharing with larger systems, doom them to entropic stagnation. The Quartet, once the center of sound and wind images, has retreated to an "airless" state--or perhaps to a soulless one.

Degeneration is not, of course, limited to the Quartet; soon Meatball's party sinks into a mad, drunken brawl. While chaos engulfs the scene, Meatball considers the "two ways he could cope: (a) lock himself in the closet and maybe eventually they would all go away, or (b) try to calm everybody down, one by one" (291). Alternative (a) requires that Meatball treat his party as a closed system in which, ultimately, entropy would ensure the damping of difference and noise; adopting this perspective would also require of Meatball that he insulate himself within an even more closed system, the closet. Becoming a closet case would be similar to the actions of Callisto, Saul, and the Quartet. But unlike these, Meatball has the negentropic capacity of organizing information and anticipating a wide variety of possible outcomes: "But then he started thinking about that

closet. It was dark and stuffy [notice the absence of wind] and he would be alone" (291). Not only does the closed space of the closet parallel closed systems--hothouses, isolation within metaphoric entropy and information theories, and soundless music--but the closet, like all closed systems, is also subject to intrusions: "And then this crew [of sailors] off the good ship Lollipop or whatever it was might take it upon themselves to kick down the closed door, for a lark. And if that happened he would be, at the very least, embarrassed" (291). He concludes that the energy necessary to order the phenomena of the party "was more a pain in the neck, but probably better in the long run" (291). Meatball's negentropic expenditure of energy, of course, saves the party from total chaos.¹⁴

Anticipating intrusions saves Meatball; he conserves his system by predicting or extrapolating from available data, and he is capable of adaptive behavior. In contrast, Saul witnesses the destruction of his system from the inside; he reports that his wife "ended up throwing a Handbook of Chemistry and Physics at me, only it missed and went through the window, and when the glass broke I reckon something in her broke too. She stormed out of the house crying, out in the rain. No raincoat or anything!" (284).¹⁵ The Handbook and its rules go out the window, and Saul must confront his inabilities to deal with the complexities of another human system. From a certain perspective, his wife is a much braver person; she leaves without protection, "No raincoat or anything." Perhaps that which "broke" in her was an ability to tolerate the closed system of her marriage to Saul; his only consolation is one-sided theorizing.

Saul's wife puts a hand-book through a window; Aubade also smashes a window, but her action is more calculated and physically consequential. After Callisto's bird dies, "as if seeing the single and unavoidable conclusion to all this she moved swiftly to the window before Callisto could speak; tore away the drapes and smashed out the glass with two exquisite hands which came away bleeding and glistening with splinters . . ." (292). This is the first act which she initiates in the story, and she faces immediate

consequences: the splinters of glass are embedded fragments of a destroyed pseudo-protective barrier, and--if one pursues the neo-colonial theme--the splinters are also a sign of her self-destructive liberation. Now she can only "face the man on the bed and wait with him until the moment of equilibrium was reached . . ." (292), if it were to be reached at all, one might add.¹⁶

Thus Aubade shares with Meatball the onus of negentropic initiatives, those actions which must irrevocably change the state of affairs within otherwise closed, entropic systems. Neither is left in an enviable situation: Aubade faces the elements from without, and Meatball may awaken to chaos from within. Entropy, in both cases, is but a measure of possibilities, and it is a mistake to subsume both under some generalized critical concept of entropy as a notion of decay. Rather, Pynchon is suggesting that real choices are at issue, that the constraints on our thinking are to be examined, and, finally, that human beings are human only to the extent that they rise above those limits which are stasis or entropy.

Eugene, Oregon

Notes

¹ Thomas Pynchon, "Entropy," Kenyon Review, 22, No. 2 (1960), 277-92.

² Three of the most often cited "entropic" readings are: Anne Mangel, "Maxwell's Demon, Entropy, Information: The Crying of Lot 49," IriQuarterly, 20 (1971), 194-208; William M. Plater, The Grim Phoenix: Reconstructing Thomas Pynchon (Bloomington: Indiana Univ. Press, 1978); and Tony Tanner, "Caries and Cabals," in City of Words: American Fiction 1950-1970 (New York: Harper & Row, 1971) 153-80.

³ Peter Bischoff, "Thomas Pynchon, 'Entropy,'" in Die amerikanische Short Story der Gegenwart: Interpretationen, hrg. Peter Freese (Berlin: Schmidt, 1976), 226; my translation. The original stands thus: "Wenn Thomas Pynchon seiner zweiten veröffentlichten Short Story den Titel 'Entropy' gibt, liefert er . . . den Schlüssel für die Interpretation dieser für sein gesamtes Werk programmatischen Story. . . ."

⁴ Gore Vidal, "The Thinking Man's Novel," New York Review of Books, 27, No. 19 (4 Dec. 1980), 10. Vidal concludes that "English teachers without science like this sort of thing while physicists are tempted to write excited letters to literary journals"--a view from which the present writer wishes to dissociate himself.

⁵ Taking issue with Tanner, however, is David Seed, in his "Order in Thomas Pynchon's 'Entropy,'" Journal of Narrative Technique, 11, No. 2 (1981), 135-53, esp. 136-37. Seed argues that "order could be the ultimate theme of the story" (148), but does not go beyond a dictionary definition of entropy.

⁶ One exception to this generalization is David Mesher's "Negative Entropy and the Form of Gravity's Rainbow," Research Studies, 49, No. 3 (1981), 162-70.

⁷ Norbert Wiener, The Human Use of Human Beings: Cybernetics and Society (Boston: Houghton, Mifflin, 1950), 7.

⁸ Lila L. Gatlin, Information Theory and the Living System (New York: Columbia Univ. Press, 1972), 151; cf. 37.

⁹ Anthony Wilden, System and Structure: Essays in Communication and Exchange, 2nd. ed. (London: Tavistock, 1972), 356-57.

¹⁰ Gregory Bateson, Steps to an Ecology of Mind (New York: Ballantine, 1972), xxv.

¹¹ Cited by Robert Sklar, "An Anarchist Miracle: The Novels of Thomas Pynchon," in Pynchon: A Collection of Critical Essays, ed. Edward Mendelson (Englewood Cliffs, NJ: Prentice-Hall, 1978), 94.

¹² Air, or rather gas, was central to Maxwell's formulation of the laws of thermodynamics, but one must be careful to make certain distinctions: as Wilden points out, there is a difference between the "theory of physics" and the "reality it studies"; in assuming "the perfect gas," Maxwell made methodological assumptions, and as Wilden continues, "in this sense, classical physics is the study of closed systems" (358). Pynchon's air/gas metaphors do not depend on assumptions similar to those of Maxwell.

¹³ Joseph W. Slade, "'Entropy,' and Other Calamities," in Mendelson, ed., 78.

¹⁴ Meatball must not be compared to Maxwell's Demon, however; as Mangel shows (198-99), the Demon is an impossibility, and even if a Demon did exist, it would have to be immortal. Cf. Wilden's more technical comments, 130, n. 2. Mangel still sees "Perception . . . working to create disorder" in Pynchon's fiction (200).

Actually, the opposite is true: there is no Demon; human beings are mortal; and they avoid perception, as do Callisto, Saul, and the Quartet, at the risk of losing their humanity.

¹⁵ The pun in this passage on "stormed out" may be intended; Aubade will let a storm in.

¹⁶ Seed goes so far as to suggest that Aubade's action "could equally well be seen as a liberating gesture which has the immediate result of freeing herself and Callisto from their hothouse" (148), but one wonders how well Callisto is prepared for this; notice that he is named only as "the man on the bed."