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Thomas Pynchon's "Entropy:"
An exploration of scientific ontologies

by

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Critics for the most part have avoided the writings of Thomas Pynchon. I suspect one reason for this is that present critical tools are inadequate for the purpose. Those critics who have analyzed V. and The Crying of Lot 49, for instance, have labeled them "novels," "new romance," "romantic epic," or "black humor." This disagreement suggests that critics have been trying too hard to classify these works which do not fulfill traditional expectations. In other words, the abstraction categories such as "novel," "new romance," "romantic epic," and "black humor" are constructs which identify elements in the books but which limit the critic's overall view of the books.

Two purposes have prompted this observation. First, I plan to approach Pynchon's "Entropy" without attempting to apply traditional labels. As much as possible I intend to focus on how "Entropy" works rather than on what it is.

The second purpose is more important. Classification based on abstraction is raised as an epistemological issue in "Entropy." This issue forms the basis for an exploration of two ontological approaches suggested by the two scientific concepts of entropy: thermodynamic entropy and entropy of information.

My main discussion will center on the relationship between the scientific concepts and the two strands of action in "Entropy." Viewed in this way, the conclusion of Pynchon's work is a choice presented to the reader, not a
single vision of "culture sinking into an equilibrium of meaninglessness."²

The problem of applying an abstract literary category becomes apparent from even a superficial examination of the work. Viewed as a short story, "Entropy" seems to be a failure. It contains three distinct settings, two seemingly unrelated plots, and little characterization. Only the overwhelming amount of precise detail suggests that this "short story" might be unified at a symbolic level.

The bare action occurs in three spatially distinct areas: in Callisto's apartment, in Meatball's apartment below Callisto's, and outside the two apartments. A surface examination of this action gives few clues as to its meaning. Outside, it is raining. Downstairs, Meatball is giving a lease-breaking party. Various people come and go, including Saul who has had a fight with his wife and the Duke di Angelis quartet which plays soundless music. The party becomes increasingly chaotic until Meatball can no longer tolerate the noise. He attempts to quiet the revelers; and the party dwindles. Upstairs, Callisto and Aubade spend their time recording his memoirs, attempting to cure a sick bird, and checking the outside temperature. When the bird dies and Aubade accepts the constant 37⁰ temperature as decisive, she breaks the window of their hermetically-sealed apartment and together they await the heat-death of the
Characterization, too, is minimal. Nowhere in the story can physical descriptions of the characters be found. Meatball, the most fully developed character (in a Jamesian sense) is realized primarily by his behavior. He moves from group to group and carries on conversations. Only at the conclusion of "Entropy" are his thoughts portrayed.

The way he figured, there were only about two ways he could cope: (a) lock himself in the closet, or (b) try to calm everybody down, one by one (p. 291).

Meatball's thoughts center on coping with the immediate situation, not on comprehending it. His guests are similarly, but less extensively, developed. Upstairs, Callisto is realized by his limited behavior, his memoirs, and his reminiscences, all of which center on his obsession with classical thermodynamics. Aubade, his girl, is even more puzzling. From the outset she seems more an abstraction than a human being.

She was part French and part Annamese, and she lived on her own curious and lonely planet, where the clouds and the odor of poincianas, the bitterness of wine and the accidental fingers at the small of her back or feathery against her breasts came to her reduced inevitably to the terms of sound: of music which emerged at intervals from a howling darkness of discordancy (p. 280).

Callisto and Aubade are developed as "characters" whose ideas seem more important than their individuality. Thus, it should be apparent that depth of personality is not a concern in "Entropy."
What is remarkable about the work is its overwhelming preciseness of detail. The first encounter with the Duke di Angelis quartet is a good example.

In the living room Duke, Vincent, Krinkles and Paco sat crouched over a 15-inch speaker which had been bolted into the top of a wastepaper basket listening to 27 watts' worth of The Heroes Gate at Kiev (p. 277).

These details seem to be interwoven into intricate patterns centering primarily on various dimensions of weather and sound.

The importance of these details to the content and form of "Entropy" will be discussed in greater detail later. At this point, however, some philosophical and scientific background seems necessary.

Science has often been considered more exact or precise than humanistic endeavors. Yet, even in science, the problem of classification based on abstraction is important. Definition of atomic structure is a good illustration. Wave was originally a classification for impulses set up by a vibration; as such waves had no mass. Particle was a classification for matter without magnitude, yet with characteristics attributable to mass: inertia and force of attraction. Recently, physicists have discovered that what is called an atom exhibits characteristics both of waves and of particles. To classify atoms as either waves or particles would be to ignore some of the vital characteristics of atomic structure; yet to classify atoms as "wavicles" would necessitate a com-
plete redefinition of waves and particles as well as a restructuring of the scientific theories based on the original definitions.

What is important to recognize is that any process involving classification based on abstractions results in a loss of specific individual characteristics which may or may not be important in another context. For example, in examining a discussion of entropy such as Wylie Sypher's chapter "Existence and Entropy," a reader can rely on a dictionary definition of the term because Sypher clearly illustrates which characteristics of entropy are important to his discussion. However, in analyzing a story such as "Entropy," where the relationships are metaphorically defined, more complete knowledge of the scientific concepts of entropy is necessary. Otherwise, the reason for centering the work around entropy may be obscured.

So far the problem of classification based on abstraction has been defined and illustrated by examples from literary criticism and from science. The two concepts of entropy represent a special case in this problem. Both are defined statistically. It is important to understand that statistical calculation is another method of classifying which is based on abstracting certain qualities from a group. In addition, the application of statistics to each concept was originally based on different assumptions.

Classical thermodynamics developed in the nineteenth
century as a result of experimentation with heat and engines. At this time most scientists believed that the universe was already determined and that scientific study would eventually lead to a precise definition of the absolute and unchanging laws of the universe. However, the results of scientific experiments did not precisely confirm the hypotheses. This imprecision was attributed to crude instrumentation; and the scientists felt that with more sophisticated equipment their measurements would eventually be exact. Meanwhile, these scientists applied statistics to their formulas to compensate for what they regarded as incomplete data.

Thermodynamic entropy, for example, was defined by Rudolph Clausius as a measure of energy which could not be transformed into work. Experimentation demonstrated that a system at equilibrium would not yield work because work is obtained from a heat differential. Equilibrium was defined as a state measured by maximum entropy. While equilibrium could be quantified, states containing energy both available and unavailable for work could not be quantified precisely.

The reasoning behind the use of statistics followed a pattern similar to this: We cannot precisely measure energy yet. Clausius' theorem (in a closed system, the entropy always increases) does generally predict what happens in a machine. Let's use statistics to compensate for our imprecise measurements. We'll define maximum entropy as a norm or most
probable occurrence. Any state not at maximum entropy we can calculate in terms of deviation from the norm. When our measurements are precise enough, we should be able to dispense with statistics.

With the findings of Heisenberg, Schrödinger, and Born in quantum mechanics and of Einstein in relativity, a new view of statistics was formulated. Alfred M. Bork summarizes this development.

Statistical ideas had been used in the nineteenth-century physics, but then it was always assumed that the basic laws were completely deterministic. Statistical calculations were made when one lacked complete information or because of the complexity of the system involved. In the statistical interpretation of quantum mechanics I have just described, however, randomness is not accepted purely for calculational purposes. It is a fundamental aspect of the basic physical laws themselves.4

Information theory is based on this new view of statistics. From the outset, information was defined statistically and operationally: it "is a function of the ratio of the number of possible answers before and after a specific problem is solved, and we choose a logarithmic law in order to insure additivity of the information contained in independent situations."5 It is easier for a non-scientist to understand what information is not. Information is not a "thing" which can be measured precisely; instead it is the expression of a relationship. Information does not contain meaning or value; these are considerations beyond the scope of present scientific theory. Information is based entirely on unpredictability or deviation from a
Entropy of information was defined by C. E. Shannon as the physical source of information. The term entropy was used because of the mathematical similarity between thermodynamic entropy (\( \Sigma \)) and information (\( \Sigma = -I \)). What is important to remember is that despite the mathematical similarity there is no physical connection between the two entropies.

The importance of this involved discussion is twofold. First, statistical calculations are used in conjunction with both concepts of entropy. This indicates that a measurement represented by either concept is always an approximation. Thermodynamic entropy is never a precise measurement of the amount of energy unavailable for work in a given system at a given time. Entropy of information is never a measurement of the amount of information a system can yield. Second, the historical development of thermodynamics and of information theory suggests that two world views may be operating simultaneously in "Entropy." This will become apparent when the separate apartments are discussed. For the present, this discussion will show how the statistical base of the scientific entropies is reflected in "Entropy."

I have already pointed to Pynchon's use of precise detail and to the physically distinct settings. The narrator of "Entropy" belongs to the "outside" although he does describe the action in the apartments. In several passages in
the work, the narrator deliberately qualifies the precise
detail by showing how the process of abstraction can be
misleading.

The narrator's view of the rain is a good illustration
of this. (This view is tied to Meatball metaphorically with
the opening sentence but does not represent his thoughts or
position.) Rain is deliberately and precisely drawn in
terms of physical sensation.

Outside there was rain. Rain splatted against the
tar paper on the roof and was fractured into a fine
spray off the noses, eyebrows and lips of the wooden
gargoyles under the eaves and ran like drool down
the windowpanes (p. 278).

The description becomes more abstract as it covers more time
and experience.

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 as April,
though the calendar read early February (p. 278).

Yet, as the additional dimensions become more abstract, the
original precision of the detail is qualified.

It is a curious season, this false spring. Somewhere
in it are Lincoln's Birthday and the Chinese New Year
and a forlornness in the streets because cherry blossoms
are weeks away still and, as Sarah Vaughan has put it,
spring will be a little late this year. Generally
crowds like the one which would gather in the Old
Heidelberg on weekday afternoons to drink Wurtzburger
and to sing Lili Marlene (not to mention The Sweetheart
of Sigma Chi) are inevitably and incorrigibly Romantic
(p. 278).

By classifying the crowds singing Lili Marlene and The
Sweetheart of Sigma Chi as Romantic, the narrator has de-
liberately emphasized a peripheral meaning of the philosophi-
cal concept (represented by Romanticism). This can be seen
as irony; but more important, it emphasizes the imprecise, approximate nature of the abstraction. The process is not accidental; for again a peripheral meaning of soul is used to shift the context.

And 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 (p. 278).

The philosophical context of soul (Romanticism) is quickly shifted to a scientific context (air, which has little substance) and then to science fiction (with "warpings"). By deliberately shifting contexts and abstraction levels, the narrator is demonstrating the dangers of such a shift.

(Essentially, the effect of the passage is to assert that changeful weather causes Romanticism.) The significance of this process is underlined by the realization of the weather's effect in an extended metaphor of Brownian motion.

So that over and above the public components—holidays, tourist attractions—there are private meanderings, linked to the climate as if this spell were a stretto passage in the year's fugue; haphazard weather, aimless loves, unpredicted commitments: months one can easily spend in fugue, because oddly enough, later on, winds, rains, passions of February and March are never remembered in that city, it is as if they had never been (pp. 278-79).

The suggestion of Brownian motion in the passage ties the process of verbal abstraction to scientific abstraction. Brownian motion occurs simultaneously with and independently from an increase in thermodynamic entropy. Because this motion is random, it cannot be measured precisely. Brownian
motion, then, is a major factor in necessitating the use of statistics, even in classical thermodynamics. Albert Einstein summarized the shift in his paper on kinetic theory.

... it will be shown that according to the molecular-kinetic theory of heat, bodies of microscopically visible size, suspended in a liquid, will perform movements of such magnitude that they can easily be observed in a microscope on account of the molecular motions of heat. It is possible that the movements to be discussed here are identical with the so-called "Brownian molecular motion." ... if the movement discussed here can actually be observed... then classical thermodynamics can no longer be looked on as applicable with precision to bodies even of dimensions distinguishable in a microscope.

The subsequent confirmation of Einstein's findings reinforces the epistemological position taken by the narrator in "Entropy."

Just as Brownian motion occurs simultaneously with and independently from an increase in thermodynamic entropy, the "private meanderings" are "over and above the public components." Like the random movement of molecules, the "private meanderings" are "Romantic" (individual), "aimless," "haphazard," and "unpredicted." They occur "in fugue," not linked by a cause-effect relationship. Finally, the "winds, rains, passions... are never remembered... it is as if they had never been" because like Brownian motion, they exist but have no effect.

The precision with which the final statement is realized contrasts with the deliberate misuse of abstraction earlier to point to the approximation characteristic of abstraction. It seems to me that through his deliberate emphasis on the
incompleteness in abstraction in some passages and his attention to precise detail in others, the narrator is raising—and answering—the epistemological question inherent in any process of abstraction: how do we know what we know? His process of metaphorical development seems to indicate that we know what we know first, from physical sensations which arise from isolated "facts" (such as the rain) and second, from that process of abstraction which is applied to these "facts."

This process of abstraction is consistently an approximation which may or may not include certain significant characteristics of the "fact."

Finally, the use of weather in the passage indicates a possible explanation for the epigraph. In the passage the weather is a "given," a fact, to which significance is attributed by the narrator. This significance is realized in terms of sound; and the relationship between the humans and the weather is characterized as "in fugue." (The sound metaphors are related to ontological issues, as I will demonstrate later.) The use of "fugue" suggests the unity of experience and, by extension, the artificiality of abstraction. Thus, the weather represents an epistemological given (discussed earlier). The epigraph, a passage about weather, also functions as a "given."

Boris has just given me a summary of his views. He is a weather prophet. The weather will continue bad, he says. There will be more calamities, more death, more despair. Not the slightest indication of a change anywhere . . . We must get into step, a lock-step toward the prison of death. There is no escape.
The weather will not change.

- *Tropic of Cancer* (p. 277)

Thus, the epigraph establishes the finality of the epistemological "given." The weather, like the process of abstraction, will not change. Men can get into "a lockstep toward death" by refusing to "know" anything. However, man still has a choice of alternative uses of abstraction which will enable him to "know" reality with various degrees of approximation.

In "Entropy" the narrator uses the method of abstraction he has established in the weather passage to undercut the assumptions of Callisto and Aubade. For example, their "paradise" is less than ideal.

Mingled with the sounds of the rain came the first tentative, querulous morning voices of the other birds, hidden in philodendrons and small fan palms: patches of scarlet, yellow, and blue laced through this Rousseau-like fantasy, this 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. Through trial-and-error Callisto had perfected its ecological balance, with the help of the girl its artistic harmony, 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. He and the girl could no longer, of course, be omitted from that sanctuary; they had become necessary to its unity. What they needed from outside was delivered. They did not go out (p. 279).

Callisto has created a paradise; but like human creations, the paradise has flaws. Even though it is realized through attention to sensory stimulation, it is also like a "perfectly-executed mobile" which delights but does not provide complete satisfaction. Ultimately, it depends on the outside
for physical needs and for contact with "reality" (represented by the penetrating sounds and the weather). Callisto's microcosm is an abstraction; and any abstraction depends on those very "things" from which it was created. The success of Callisto's artistic creation depends on his being an ideal; unfortunately, he is fallible (the death of the bird is not caused by an absence of heat transfer and the constant $37^\circ$ temperature is not the omen of impending universal heat-death).

In another passage, the narrator illustrates how Aubade, too, abstracts from human experience without considering alternative possibilities.

In the hothouse Aubade stood absently caressing the branches of a young mimosa, hearing a motif of sap-rising, the rough and unresolved anticipatory theme of those fragile pink blossoms which, it is said, insure fertility (p. 287).

Neither Aubade nor the reader can know that the tree will blossom and bear fruit until it actually happens. Other factors such as disease and adequate nourishment can affect the blossoming and fruition of a tree. By deliberately couching Aubade's experience in terms of qualified abstractions ("hearing a motif," "unresolved anticipatory theme") the narrator is again pointing to the imprecision and deception inherent in abstraction.

Related to the epistemological "given" based on the nature of abstraction is the idea of ontology: what is reality? The epistemological assumption indicates that
because man must rely on abstraction "to know what we know," "reality" (what we know) is also an abstraction. Thus, any one human experience can result in multiple concepts of "reality." The existence of two such concepts is indicated by a comparison of the Meatball view of the weather (which was discussed earlier as attached to Meatball but delineated by the narrator) with Callisto's view. Since their apartments are close together, presumably each tenant is experiencing the same phenomenon.

But for three days now, despite the changeful weather, the mercury had stayed at 37°C Farenheit. Leery at omens of apocalypse, Callisto shifted beneath the covers. His fingers pressed the bird more firmly, as if needing some pulsing or suffering assurance of an early break in the temperature (p. 280).

Unlike the Meatball view which focuses on change, unpredictability, and deception as qualities of the weather, Callisto sees the constant 37°C temperature as an omen of apocalypse, which subsequently develops as a vision of the heat-death of the universe.

Ironically, it is Callisto who names his own method of abstracting while hoping to avoid it.

He was aware of the dangers of the reductive fallacy and, he hoped, strong enough not to drift into the graceful decadence of an enervated fatalism (p. 283).

Reductionism arises out of a Newtonian world view which assumes, among other things, that the universe is like a giant machine operating on consistent, ultimately comprehensible principles. Therefore, a construct of "reality"
can be made by separating, classifying, and analyzing its component parts until the basic "stuff" of the universe is reached and analyzed. Once the "stuff" is reached, absolute laws of the universe can be formulated by reversing this process (reconstructing the machine). Ultimately, the relationships between the laws can be established through the use of operational analogies. In classical thermodynamics, for example, an increase in entropy was first observed at the macrocosmic level (in experiments with machines). The use of statistical calculation in further investigation revealed increases in entropy at microcosmic levels (in gases, for example). From this, the second law of thermodynamics was generalized to apply to any isolated system—including the universe.

Callisto, by seeking "correspondences" between Gibbs' prediction and observable social phenomena, is trying to replace reductionism with analogy. Unfortunately, he fails to realize that the very processes of analogy and classification are potentially reductive. Thus, once Callisto has classified Madison Avenue advertising and American consumerism as indications of an impending "heat-death for his culture," he has eliminated, in his own mind, alternative explanations.

The alternative approach, represented by Meatball, is holism. This view assumes that experience of the universe and its physical manifestation are inseparable. As such,
no absolute assumptions or schematization of "reality" can be made. When experimentation or experience necessitates some contact with this "reality," the "reality" is broken into the largest manageable pieces and is dealt with in terms of the relationships between the pieces rather than in terms of the pieces themselves. In science, this process is known as "systems theory;" and while it is a reductive process, it admits more than one possible explanation for phenomena because relations generalized in one system are not assumed to be applicable to different systems.

Meatball seems to have few preconceived ideas about reality. His preference for alcohol over drugs is based on practical reasons. "Washington is lousy with Feds" (p. 281).

In listening to Saul's problem, Meatball points to Saul's reductionism, "Maybe she thought you were acting like a cold, dehumanized scientist type" (p. 285). "You're sort of, I don't know, expecting a lot from people" (p. 286). Finally, Meatball points to the problem of ontology.

"Well, sure . . . you were using different words. By "human being" you meant something that you can look at like it was a computer. It helps you think better on the job or something. But Miriam meant something entirely--" (p. 286).

The same approach can be seen in Meatball's discussion with Duke about soundless music.

A horrified awareness was dawning on Meatball. "And the next logical extension," he said. "Is to think everything," Duke announced with simple dignity. "Roots, line, everything."

Meatball's "But" indicates that from his own experience, soundless music won't work.

Finally, Meatball's approach to "reality" which avoids classification other than where it is verifiable by experience has one additional dimension. When he can no longer deal with "reality" as a whole (as when the noise and chaos of the party become unbearable and unmanageable), Meatball resorts to what seems to be a "systems" approach.

So he decided to try and keep his lease-breaking party from deteriorating into total chaos: he gave wine to the sailors and separated the mura players; he introduced the fat government girl to Sandor Rojas, who would keep her out of trouble; he helped the girl in the shower to dry off and get into bed; he had another talk with Saul; he called a repairman for the refrigerator, which someone had discovered was on the blink. This is what he did until nightfall, when most of the revellers had passed out and the party trembled on the threshold of its third day (pp. 291-92).

As the passage indicates, Meatball is less concerned with the nature of "reality" than he is with functioning within it. However limited his understanding of "reality" is, his approach is more accurate than Callisto's because he allows for alternative explanations.

Aubade has the most unusual approach to "reality." Unlike Callisto and Meatball who emphasize human experience as a source for ideas of "reality," Aubade's approach is highly theoretical and second-hand. Not only do sensuous experiences reach her "reduced inevitably to the terms of"
sound" (as I noted earlier), but she is constantly forced to readjust her concept of "reality" to include new, previously unclassified phenomena.

Counterpointed against his words the girl heard the chatter of birds and fitful car honkings scattered along the wet morning and Earl Bostic's alto rising in occasional wild peaks through the floor. The architectonic purity of her world was constantly threatened by such hints of anarchy: gaps and excrescences and skew lines, and a shifting or tilting of planes to which she had continually to readjust lest the whole structure shiver into a disarray of discrete and meaningless signals (p. 283).

Aubade's reductionism, an obsession for order reduced to musical terms, is complete. The greater danger lies beyond her reliance on abstraction, for she depends entirely on Callisto for "feedback" (in this case referring to direct experience). She cannot point out fallacies in his thinking because she has accepted his assumptions. She has only the power to follow them to their logical conclusion.

I have demonstrated how the weather and sound images establish the epistemological and ontological dimensions of "Entropy." These dimensions, however, do not represent the complete theme. Instead, they function as hypotheses in an experiment designed to determine the human value of these ideas. For this theme, the hypotheses must be tested in terms of metaphorical and behavioral interactions.

It should be apparent that "Entropy" is a story of ideas rather than personalities and that these ideas are controlled by scientific and metaphorical concepts of entropy.
Entropy is an effective metaphor in that the two scientific concepts of entropy are physically unrelated and theoretically related.

The scientific paradox is realized in "Entropy" by the use of two apartments. These apartments roughly correspond to the two physically unrelated fields of thermodynamics and information theory. Callisto's apartment represents the world of thermodynamic entropy in which everything is slowly evolving toward sameness and equilibrium. In Meatball's apartment, entropy of information dominates. Here, value is placed on the new and the unpredictable. Yet, the metaphorical structure contradicts this. Weather and sound are common experiences in both apartments. This is necessary to indicate the unity of experience and the theoretical relationship between the scientific concepts.

The resolution of the paradox in "Entropy" lies in the realization that the interpretations of weather and sound are radically different. If the interactions between weather and sound yield various approaches to reality, sound images ultimately determine the theme of the story. This occurs because sound is a source of information; and information is the basis for establishing the meaning and value of human experience as well as the method for signifying this value. Saul indicates this by describing the value humans attach to sound symbols.

There are Europeans wandering around North Africa
these days with their tongues torn out of their heads because those tongues have spoken the wrong words. Only the Europeans thought they were the right words (p. 285).

Information, however, is not a complete solution to problems of human value. In the first place, little is known about the value and use of information.

"I don't know anything about communication theory."
"Neither does my wife. Come right down to it, who does? That's the joke" (p. 284).

The process of receiving information without classifying it is confusing as well as disappointing like a "stretto passage in the year's fugue" (p. 279). Changing one's concept of "reality" to fit each "bit" of information as Aubade tries to do is equally defeating. The process results in continuous readjustment" lest the whole structure shiver into a disarray of discrete and meaningless signals" (p. 283). Sensuous experience is dulled by this process. One "hears a motif of sap-rising" (p. 287) rather than feels the rough branches or smells the fragile pink blossoms of a mimosa tree. Ultimately, the process results in human exhaustion and in separation from human relationships.

She crawled into dreams each night with a sense of exhaustion, and a desperate resolve never to relax that vigilance. Even in the brief periods when Callisto made love to her, soaring above the bowing of taut nerves in haphazard double stops would be the one singing string of her determination (p. 283).

Reducing information to a single vision of "reality" as Callisto attempts to do is equally limiting. It leads to a very limited, and possibly erroneous, set of judgments.
Music, and literature for example, confirm Callisto's vision of heat-death.

Sade, of course. And Temple Drake, gaunt and hopeless in her park in Paris, at the end of Sanctuary. Final equilibrium. Nightwood. And the tango. Any tango, but more than any perhaps the sad sick dance in Stravinsky's L'Histoire du Soldat (p. 287).

Such improbably related occurrences as the death of a bird and a constant $37^\circ$ temperature confirm Callisto's vision of heat-death.

Ultimately, both Aubade's and Callisto's approaches lead to impotence and meaninglessness. Their tentatively balanced relationship has collapsed under the power of Callisto's reductive ontology. Aubade's structure turns into "the ashes of her lovely world" (p. 292), destroyed by Callisto's irrefutable interpretation of the constant temperature. Together, they wait until

the hovering, curious dominant of their separate lives should resolve into a tonic of darkness and the final absence of all motion (p. 292).

The action in Callisto's apartment is concluded in terms of music (dominant-tonic) and in terms of thermodynamic entropy. Maximum entropy represents a state from which no information can be extracted. There is no heat or energy differential, only uniformity.

On the other hand, holistic or systems approaches to information have their drawbacks. Information must somehow be separated from noise.

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. Redundance. Irrelevance, even. Leakage. All this is noise. Noise screws up your signal, makes for disorganization in the circuit (p. 285).

As Saul indicates, the problem occurs when the same word contains both information and noise.

Information can also be irrelevant, as in the exchange between Meatball and Sandor Rojas.


Information is often ambiguous, as Krinkles's "put-on" indicates.

"When Dave was in the army, just a private E-2, they sent him down to Oak Ridge on special duty. Something to do with the Manhattan Project. He was handling hot stuff one day and got an overdose of radiation. So now he's got to wear lead gloves all the time." She shook her head sympathetically, "What an awful break for a piano player" (pp. 286-87).

This ambiguity can be harmless; or it can be the basis for serious misunderstandings, such as the fight between Saul and Miriam.

"Miriam has been reading science-fiction again. That and Scientific American. 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."

"Why not," Meatball said.

"Indeed, why not. In fact it is sort of crucial to communication, not to mention information theory. Only when I said that she hit the roof. Up went the balloon. And I can't figure out why" (p. 285).
Finally, information can be false; and acting on false information can be very embarrassing, as the arrival of the sailors at Meatball's apartment shows.

"This is the place," shouted a fat, pimply seaman apprentice who had lost his white hat. "This here is the hoorhouse that chief was telling us about." A stringy-looking 3rd class boatswain's mate pushed him aside and cased the living room. "You're right, Slab," he said. "But it don't look like much, even for Stateside. I seen better tail in Naples, Italy." "How much, hey," boomed a large seaman with adenoids, who was holding a Mason jar full of white lightning. "Oh, my god," said Meatball (p. 287).

In Meatball's apartment, few assumptions are made about "reality." Information, representing what is new and unpredictable, is a close approximation of experiential data. But information can be ambiguous, irrelevant, noisy, and false because it carries no context, value, or meaning. These must be attributed by the humans who use it, and human ideas about "reality" are inevitably constructs.

Two suggestions for dealing with information can be found in "Entropy." The first is described by the narrator in the opening description of "outside."

There were a lot of American expatriates around Washington, D.C., who would talk . . . about how someday they were going to go over to Europe for real but right now it seemed they were working for the government. Everyone saw a fine irony in this. They 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. They would haunt Armenian delicatessens for weeks at a stretch and invite you over for bulghour and lamb in tiny kitchens whose walls were covered with bullfight posters. They would have affairs with sultry girls from Andalucia or the Midi who studied economics at Georgetown. Their Dome was
a collegiate Rathskeller out on Wisconsin Avenue called the Old Heidelberg and they had to settle for cherry blossoms instead of lime trees when spring came, but in its lethargic way their life provided, as they said, kicks (pp. 277-78).

By opening oneself to the widest possible range of experience (like using the largest possible sample for a statistical base), one assures that his construct of "reality" is based on as close and as accurate information as possible. At the same time, one must recognize the "fine irony" inherent in the discrepancy between information and that which it represents. Otherwise, one may become the unwitting victim of the ultimate cosmic joke as the epigraph suggests and as Callisto is realized.

Once the basic epistemological assumption is accepted, a choice of alternative ontological approaches presents itself. Like Callisto, one can reduce experience to a construct of "reality;" like Aubade, one can continue to adjust a construct of "reality" to experience; or like Meatball, one can avoid a single construct of "reality" as much as possible. In the terms of "Entropy" all ontological approaches have drawbacks; but Meatball's approach is most viable. Only Meatball's approach allows for a practical incorporation of new experience into a construct of "reality" because the approach allows for multiple explanations. Only Meatball's assumptions and behavior are not ironically undercut by the narrator. At the end of the story, only Meatball is shown to be capable of positive action.
To me this realization of Meatball indicates that while his approach is not a complete solution to the problems raised in "Entropy," it is the most positive choice of the three, from the narrator's point of view. The choice remains the reader's, however, since the events in "Entropy" occurred "back then" in early February of '57" (p. 277).

"Entropy" raises additional issues which I have neither time nor space to treat. Let me suggest a few, however. There is a strong indication that Callisto and Aubade, respectively, represent the reductionist tendencies of science and art, and that Saul and Duke, respectively, represent the non-reductionist hopes of science and art. "Entropy" does indicate, too, that Aubade has relied too heavily on Callisto for her ideas. Does this mean that Meatball (mankind) needs to see art and science in new ways? Does this also mean that art can't depend on science?

In addition, the story raises serious questions about the nature of metaphor. Is it possible that metaphor, constructed with multiple referents and an eye toward hypothesis, could be a greater source of "truth" than reductionism or even systems analysis? Certainly, Pynchon, John Barth, and Kurt Vonnegut indicate this possibility.

"Entropy" seems to me to be significant in that viewed as an exploration, it suggests further possibilities for literature beyond codification of forms of meaninglessness. Pynchon's more recent books seems to have their comic
and satiric roots, as well as their moralistic tendencies, in "Entropy". This needs to be explored further, but in closing let me suggest that the warning at the end of Gravity's Rainbow is very similar to that of "Entropy."

Our view of the world and its potential failure are our own responsibility. From the point of view of "Entropy," at least, we still have a chance.
Footnotes

1Thomas Pynchon, "Entropy," The Kenyon Review, 22 (1960), 277-93. Subsequent quotations from the story will be indicated solely by page number.

2Arthur Mizener, "The New Romance," The Southern Review, 8 (Winter, 1972), 106-17. Mizener's article is the only one I have found that analyzes "Entropy." The article is an attempt to define "new romance" as exemplified by "Entropy" and by The Crying of Lot 49. His interpretation of "Entropy" is based primarily on the metaphorical dimensions developed within the story rather than on a clear understanding of the scientific concepts. Thus, some of his observations and his conclusion are faulty. I do not plan to refute his article directly.


4Alfred M. Bork, "Randomness and the Twentieth Century," The Antioch Review, 27 (1967), 44.


7There is, however, a theoretical relationship which is illustrated by the problem of Maxwell's Demon. This is carefully discussed in Brillouin, pp. 152-82.

List of Works Consulted


What is Life? was originally published in 1944; Mind and Matter in 1958. These articles were combined for this volume.


