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"information is negative entropy" → something for my English brain to ponder

**The Science of Art "Faithfully Presented": Entropy in British Victorian Literature**

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**Abstract**

In the chemical world, entropy, or the randomness and chaos of a system, must continually increase; it is much more favorable for things to fall apart than to be put together. This scientific concept can also be rightly applied to the study of literature. While it is true books contain information put together into some sense of order from chaos, making them counterintuitive to entropy, I am convinced these works must still obey the laws of thermodynamics. There must be an increase in chaos somewhere, and if it is not within the words themselves, it must lie within the ideas they represent, their interpretation by readers, and the deconstruction of the text through literary analysis. In this study, the works of Victorian authors including Charles Dickens and Thomas Hardy are deconstructed into entropic elements including the lack of a reliable center and the struggle between the compulsion to repeat and the desire for revolution. Examination of entropy in these texts validates their claims to be realistic novels portraying the nuance of authentic life. Entropy applied to literature calls readers to continually deconstruct, wait expectantly for the inevitable eb and flow of light and darkness, and accept unanswerable questions and incomplete endings. This is real life; this is entropy.

The analysis of literature and chemical analysis are most always thought of as mutually exclusive. There are those who attend college to study the Classics and those who do so to carry out Claisen condensations. Nonetheless, the simultaneous synthesis of exigent literary ideas and organic compounds has vastly enriched my education and my perspective on humanity. I cannot and will not see the two subjects of my passions needlessly separated any longer. Literature is a real-life, macroscopic representation of the chemical world, and it must obey the same laws of nature subject to everything under, and including, the sun.

In the scientific world of thermodynamics, entropy is one of the major driving forces of any reaction. As a form of energy, entropy, symbolized by  $\Delta S$ , cannot be created or destroyed; it simply flows from one place to another and changes between forms. This concept is known as the First Law of Thermodynamics or the Law of Conservation of Energy. The Second Law of Thermodynamics provides an interesting point of analysis for literary studies. According to this law, the entropy of a closed system must inevitably decrease to zero; all things must fall apart, and order must become chaos (Anger 63). The necessitation of decay is inextricably linked with the First Law; a disordered system liberates more energy to be used for productive purposes. In fact, the Gibbs Free Energy equation,  $\Delta G = \Delta H - T\Delta S$ , allows one to predict whether a reaction will occur based on if it will consume more energy than it will produce. If it does, the reaction is inefficient and unlikely to occur; the  $\Delta S$  is negative. Conversely, a positive  $\Delta S$ , or positive entropy, is “desired”; it liberates energy as things fall apart.

The first moment of connection for me between scientific entropy and literary entropy originated from Lenninger's *Principles of Biochemistry*: “Information is negative entropy” (Nelson 20). In the purest sense, putting the 26 letters of the English alphabet together into syllables, words, sentences, and paragraphs is inherently anti-entropic. Alphabet soup is more random and chaotic than lines of prose or poetry. However, I argue the process of literary

interpretation combats the negative entropy required to place coherent words on a page. Thus, interpretation gives literature a net positive amount of entropy, proving that what we read and study is a true representation of the laws of nature working in everyday life.

Others have shared similar thoughts on the intersection of literature and entropy. Razumovskaya writes about translation of texts between languages as both an art and a science and speaks to the “ambiguity [that] appears at the crossing point of entropy (change, disorder) and preservation” (Razumovskaya 263). A paradigm exists, described by R. Arnheim, where the maximum quantity of information —the maximum order — is transmitted most efficiently in the way of the most disorder (qtd. in Razumovskaya 264). Looking forward to the Victorian era, most notably beginning in the 1850s and 1860s, individuals began to incorporate the science of energy laws and Darwin’s theory of evolution into their understanding of the world around them. This new knowledge base took the form of concerns over “work, waste, and efficiency” (MacDuffie 207) and the energetic need for heightened productivity. The word entropy was not coined until 1868, and while the similar scientific concept of energy had already been abstractly applied to the realm of everyday life, the same was not so for this much newer concept (MacDuffie 209, 211). Traditionally, evolution was viewed as positive; it indicated a world of increasing complexity, order, and progress (MacDuffie 208). Evolutionary progress was consistent with an anabolic process, building up a superior species and perfecting its function in the world. On the surface, this seems much more appealing than the catabolic, chaotic alternative: entropy. However, as Herbert Spencer points out, ““if evolution of every kind is an increase in the complexity of structure and function that is incidental to the universal process of equilibration and if equilibration must end in complete rest, what is the fate toward which all things tend?”” (qtd. in MacDuffie 208). Thus, the original notion that evolution and entropy are foils is oversimplified and misconstrued. Again, all things must obey the laws of

thermodynamics, and a fuller understanding of humanistic experience is one that is informed by all avenues of scientific progress.

In its own revolution, the notion of realism was introduced to the literary landscape in the mid to late Victorian era. Authors like Dickens, Eliot, and the Brontës attempted to write novels in which their characters and settings were true to real life. While Hardy's works are often viewed, as more naturalist because the settings and outside situations of his novels overpower his central characters' own minds, he too displays moments of realism where he believes his protagonists matter as individuals who stand up to the ideological state apparatuses (ISAs) of the era and their normalizing judgements. Hardy's alternate title for *Tess of the D'Urbervilles*, "A Pure Woman, Faithfully Presented" highlights this desire to show readers something not necessarily joyous or complete, but real. Eliot writes, "The aim of Art, in depicting any natural object, is to produce in the mind analogous emotions to those produced by the object itself... this aim is not attained by transcribing, but by translating it into the language of Art" (qtd. In Taylor 21). The language of Art is clearly extrapolated by the parsing of Victorian works for their entropic elements. While what is produced on the page is fictional, the implications for both the Victorian and modern reader are translated to chaotic reality.

In this study of British Victorian literature, focused on the works of Dickens and Hardy, I survey the ways entropy works as a destabilizing force. Through lack of a definable center, the compulsion to repeat around such a "center", and subsequent calls to revolution, the impossibility to define any single aspect of these works portrays tangible evidence of the ripples of entropy propagated from the fictional to the real world. Entropy is natural, and thus realistic; it is based on fundamental scientific principles that work in all things, whether immediately evident or not. Aligning the examination of entropy with Victorian literature gives scientific validity to the naming of those works as works of realism and proves that the lives of their characters are

“faithfully presented” (Hardy) by these thermodynamic standards. By adhering to the necessities of entropy, these works represent life as it was, and life as it currently is, because the meaning of the past continues to change in light of the present. Viewing entropy studies as a means to enriching the understanding of Victorian realism and life means one never needs to stop deconstructing, and this continual reexamination allows for reconstruction of ideas about history and modern reality over and over again. Victorian literature’s realistic portrayal of entropy’s effects on individuals and societies provides the comforting promise that the struggles of life are not entirely unique or isolated. Grappling with questions that have no answers and situations that seem entirely uncontrollable is an expected and necessary consequence of inhabiting a world bound by scientific law, but this is not cause for despair. Just as entropy causes the decay of the earth and its inhabitants to dust, it promises the possibility of illumination and the chance to lead a life of “incalculably diffusive” (838) influence while we are here.<sup>1</sup>

### **Romantic Roots and Victorian Transition**

Before the realism of the Victorian age, writers of the Romantic era began looking to nature to understand the fundamental Truths of life. For the writers of this era, observational learning from the natural elements was much preferred to “grow[ing] double” (Wordsworth) over a book. While the laws of conservation of energy and Darwin’s theory of evolution were not yet published, Romantic poets had some unconscious awareness of entropy in their works, proving its concepts expand across space, time, and school of thought.

The poetry of Percy Shelley is intimately concerned with changes in nature over time, connecting to both evolution and entropy, especially in “Mutability.” The first three stanzas present negative ideas about the force of mutability; the clouds are described as restless and soon “lost for ever” (line 4). While they are also described as radiant, this radiance is not associated with tangible joy or benefit. Instead, it is due to the way “we...as clouds” (line 1) move through

the night sky too fast. Here lies the Romantic argument that trying to learn too much and make bounds in mechanical and societal progress means missing the finer points of nature. In the same manner, the once sweet songs of Coleridge's Eolian harp <sup>2</sup> tend to become "dissonant strings" (line 5) over time. Though the given circumstances may appear to be the consequences of moral decline of the Romantic era, these descriptions are simply consistent with ever-increasing entropy. They are expected and necessary changes, and Shelley acknowledges this in the final stanza where mutability is allowed to take on qualities of joy as well as sorrow and freedom to chart a new course every day. While mutability, like entropy, is inevitable, it does not have to be viewed only for its muddled shades of gray but for its ability to spark a reaction of increasing light.

John Keats weaves similar ideas in his works. In fact, all his poetry is influenced by the urgency of his impending death pressing heavier than the weight of entropy does for most. <sup>3</sup> In "Ode on a Grecian Urn", the urn stands as a physical representation by which to judge the passage of time. Comparing its scenes to the present day makes the years between evident. This relic is, in a way, an object of negative entropy. It begs for the past to be continually presented to the present. However, the act of exposition and changing understandings of what the urn means brings it into line with pervasive, positive entropy. The fact that the urn can simultaneously contain as many interpretations of itself as it has viewers without shattering into shards of clay, all the while proclaiming the simple idea that "Beauty is truth, truth beauty,—that is all/ Ye know on earth, and all ye need to know" (lines 49-50) classifies the urn as a superb agent of entropy and representation of the realities of every time period from which it is looked back on as a teacher of history.

While influenced by the thinking of the Romantics, Victorian realism took things a step further. Rather than strictly viewing nature through a transformed mind, the exchange went both



ways as nature and man coexisted and exchanged matter and ideas with the aim of representing real, authentic life. However, the Romantic roots are still of paramount importance for bringing about deep thought and conversation on the intersection of nature and man as they relate to entropy.

### **(Lack Of) A Center**

A central tenet of Jacques Derrida's deconstructionist theory is the lack of a definable center. In his essay on "Structure, Sign, and Play in the Discourse of the Human Sciences", Derrida relates Lévi-Strauss' ideas to the necessity of freeplay, chance, and change in a way that contradicts the need for totalization. Here, any new structure must be modeled on catastrophe, and infinite substitutions are allowed, not because the field is too vast, but because it lacks a center to serve as a solid foundation (Derrida no pagination). A word, principle, or situation cannot have just one meaning, and the impossibility of establishing a set definition is what informs the continued study of literary works. The very act of trying to define a concept introduces even more definitions. For the purposes of this analysis, it is more helpful to liken this lack of a center to diffuse concentric circles coming from a quasi-center that is either unproductive or nearly absent. As entropy necessitates, these "centers" fall apart into nothing, leaving ripples of energy spreading outward when they do.

Perhaps the most obvious example of this faulty center is the Court of Chancery in Dickens' *Bleak House*.

This is the court of Chancery; which has its decaying houses and its blighted lands in every shire; which has its worn-out lunatic in every madhouse, and its dead in every churchyard. (15)

The court is organized into a particular structure, but the ancient, clunky architecture has never been productive as long as the novel's characters can remember. Wright remarks, "Just as

the grotesque cannot ultimately be defined, Chancery cannot be pinned down, and those who insist they understand it are operating under an illusion” (Wright, 99). The court’s cases, including Jarndyce vs Jarndyce eventually run down into nothing; they consume themselves, leaving behind a litter of documents and ruined lives like Tom Jarndyce and Richard Carstone. Through years of entropic reactions, chaos dissipates from the heart of Chancery to the people of London. Patterns of daily life become trapped inside the concentric web of the court. For Miss Flite’s Birds, the web is a physical cage from which “Hope, Joy... Dust, Ashes...Rags... Precedent...and Spinach” (235) cannot be freed until Jarndyce vs. Jarndyce is decided. Miss Flite is caged just like her birds, and Mr. Krook, called Chancery himself, remarks of the Court, “I go to see my noble and learned brother pretty well every day, when he sits in the Inn. He don’t notice me, but I notice him” (70). Chancery brings these characters back to its faulty center, day after day, promising a different result than what has always been. Reading this diffusive nature of the Court as an agent of entropy means accepting its presentation of reality. Indeed, there are systems all around us today that operate in the same unproductive manner. As disheartening as it is, it stands to reason that it is much easier, much less energy consuming, to let eroding systems crumble rather than attempt to stop them. For Dickens, his satirization of the Court and portrayal

of individual, redemptive characters such as Esther, is an acknowledgement of the inherent balance of decay and reform in life.

Esther Summerson, as the developing woman of the hearth, can be read as a stabilizing center of the novel. The unquestionably uncentered Howard Skimpole says the following of Dame Durden:

When I see you, my dear Miss Summerson, intent upon the perfect working of the whole little orderly system of which you are the centre, I feel inclined to say to myself — in fact I do say to myself very often— *that's* responsibility! (603)

Wright argues that Dickens chooses to portray Esther as a reliable center because of his own discomfort with the idea of true, unhindered entropy and its tendency towards grotesqueness in the real world (Wright 109). However, it is important to remember that the truth of entropy does not necessitate the falsehood of every element of order. The synthesis of fats for storage in the body requires the expenditure of some of the very energy, in the form of ATP, that the body must work to create. Regardless of the apparent waste of energy, this process happens every day and is vital to our survival. Therefore, the portrayal of Esther as a “good” center is still faithful to reality. While she creates order, it will never surpass the level of the chaos of Chancery; entropy must pervade. Moreover, there are elements of combustion laced within her very identity; the similarity of the name Esther to the reactive organic functional group called by the same name (spelled “ester”) should not be ignored. Like a chemical willing and ready to react, Esther gives of herself tirelessly to the point where she reflects on her personal happiness and identity only through the lens of others. She nearly dies and becomes permanently disfigured while nursing Charley through his smallpox infection (556). Her compassion is commendable, but it is often to her own deficit. In the novel’s final passage, Esther rejects Woodcourt’s claims about her beauty,

instead replying, ““But I know that my dearest little pets are very pretty, and that my darling is very beautiful, and that my husband is very handsome, and that my guardian is the brightest and most benevolent face that ever was seen...” (989). In her attempts to create lasting happiness, Esther dissipates elements of herself; even her thoughts in the novel’s final line stop short of a complete sentence. *Bleak House*’s conclusion is marginally happy, especially when compared to many other Victorian novels, but it is, most importantly, real. Incomplete, unsure, and still somewhat unmended, Esther’s closing assessment of her life is both believable and entropic.<sup>4</sup> Her attitude does not attempt to negate the tragedies of her story, rather she recognizes their culmination to her current position in life and attempts to be content with this reality.

Dickens’ final novel published before his death, *Our Mutual Friend*, provides its own examples of equally destabilizing centers. In its sections focusing on the aristocratic life of the Podsnaps, the Veneerings, Twemlow, the Analytical Chemist, and the Buffers, to name a few, the high society’s feeble attempts at social order and progress are laughable, even more so when juxtaposed to the chapters chronicling the eroding lives of Gaffer, Jenny Wren, Mrs. Betty, Sloppy, and the like. The very description of “Podsnappery” as “confined within close bounds” and “requiring everything in the universe to be filed down and fitted to it” (132) is unrealistic and is meant by Dickens to invoke criticism of those who think it is plausible. However, Bella Wilfer is shown as one example of an individual both associated with the rich yet morally sound and eventually functional as a steady center. Initially consumed with her misfortune in the death of her rich fiancé, Bella becomes disgusted with the moral degradation of Mr. Boffin brought about by his inheritance of the dust heaps of John Harmon; ““The best wish I can wish for you,”” Bella tells Boffin, ““is... that you had not some single farthing in the world. If any true friend and well-wisher could make you bankrupt, you would be a Duck; but as a man of property, you are a

Demon” (584). From then on, even in her marriage to Rokesmith (Harmon), Bella has the intentions to work against the useless, entropic culture of playing parts and acting pristine: “I want to be something so much worthier than the doll in the doll’s house” (663). She is presented as the great moral compass in this Dickens work, but these instances in which she is praised for her morals are fabricated and tainted by John Harmon’s scheming. Under Harmon’s direction, the Boffins put on an unbearable facade to teach Bella a lesson on the corrupting power of fortune. While executing the plan, Mr. Boffin tells his wife, “She’ll come through it, the true golden gold. That’ll be the happiest piece of work we ever done” (753). Once she is told the truth, Bella expresses her sincerest thanks to Harmon for exposing the errors of her ways and making her a better person, but this does not excuse the fact that Harmon and the Boffins’ means of tricking Bella show an abuse of power and a destabilizing locus of control.

Emphasizing this illusion of control, John Harmon’s multiple identities and his inconsistent success in ordering them all is a ubiquitous reminder of the impact of a lack of a true identity on an individual. In *A Solo* and *A Duet*, “Rokesmith” reveals the elements of his past to the reader all in one place: “So John Harmon died, and Julius Handford disappeared, and John Rokesmith was born” (366). He goes on to grapple with the question: “Should John Harmon come to life? If yes, why? If no, why?” (366). The notion that he has control over who he brings back to life seems to imply autonomy over the entropic line between existence and erasure, but the fact that he ultimately contains all of these identities and realities at once, in one earthly form, sets up the conditions for a high-pressure reaction in a closed system, a fate truly entropic. This chaos emanates from John Harmon in his continual deception of Bella. He purposely propagates lies and involves others in his schemes to serve his own purposes. He is satisfied to marry Bella after she passes his “test”, but Harmon immediately makes moves to shape Bella

into a mindless housewife once they wed (666). Again, like the faulty center of Chancery, negatively altering the lives of Miss Flite, Mr. Krook, and Richard, Harmon stifles Bella and imprisons her into his perception of a good wife.<sup>5</sup> She crosses the line from animate to inanimate life and turns into the doll she fought so hard to avoid becoming (Thomas 8). The chaotic execution of Harmon's scheme is enough to undermine Bella's autonomy and leave her in an existence where she is no longer the strong individual she has shown herself capable of being. Her influence is stifled, much the opposite of *Bleak House's* Esther Summerson. Entropy, in Bella's case, makes readers aware of the universal struggle for control against outside forces, whether people or the whims of nature. Because of this power struggle, she does not accomplish all she could have given her initial fiery spirit. However, Bella can still easily be read as a likable character and commended for her good intentions and development of self-awareness throughout the novel. Redemptively, some positive influence uses the laws of entropy to diffuse through the text despite other characters' attempts to quell it.

Most shockingly, the didactic passage on page 105 claims that "For Evil often stops short at itself and dies with the doer of it, but Good, never" (105). This assertion appears directly opposed to the idea of entropy, and it seems odd to consider that evil may somehow be intrinsically less pervasive than good. Numerous instances following this statement prove it fanciful thinking; after Headstone's murderous attack on Eugene Wrayburn; Headstone cannot even find "that poor mockery of relief" that comes when the "overweighted beast of burden... can for certain instants shift the physical load, and find some slight respite" (770). Instead, he sits like a "decaying statue... under the steady pressure of the infernal atmosphere in which he ha[s] entered" (779, 770). Following Rogue Riderhood's discovery of Headstone's intention to frame him, both men drown in the river together, Headstone saying, "I'll hold you living, and I'll hold

you dead. Come down!” (781). The first act of evil propagates, leading to more death; no good is seen beyond the grave. As another example, Jenny Wren suffers the lifelong impact of her father’s alcoholism and is forced to become his stern, caring mother while still a child. Dickens concludes the chapter entitled “A Piece of Work” with a narratorial lament for Jenny: “How often so dragged down by the hands that should have raised her up; how often so misdirected when losing her way on the eternal road, and asking for guidance. Poor, poor little doll’s dressmaker!” (243). Both instances of extensive wickedness prove the idea that good is more pervasive than evil is clearly false in these cases. This is another bold, intentional choice of the satirical Dickens. In claiming these reverse words of Mark Antony in *Julius Caesar*,<sup>6</sup> Dickens introduces ambiguity to the said “eternal law” and aligns himself with the entropic claim that the quality of a substance, whether good or bad, has no bearing on its inevitability to spread. Reality is reality, pleasant or unpleasant. It should not be expected that good will cascade forward without ceasing, but neither will evil. Contentedness comes in accepting the reality of the space in between the “neutral tinted haps and such” (Hardy).

Drawing closer to the 20th century, Victorian ideas of religion, purity, and the institution of marriage are presented as a centering force in *Tess of the D'Urbervilles*, but Hardy’s own complicated relationship with the faith leads him to write these forces as destined for disassembly under the “ache of modernism” (124). The institution of marriage serves as a broken center in *Tess*. After spending the night nested in foliage on her journey to Flintcomb Ash, Tess wakes to find many pheasants, some dead, some writhing in pain. ““Poor darlings,”” Tess exclaims, ““to suppose myself the most miserable being in the presence of such misery as this!”” (279). Previously consumed with her own judgment by Victorian society, Tess begins to expose the cracks in the scrutinizing center of marriage and the ISAs and normalizing judgment that

keep it in place. The narrator remarks, “She was ashamed of herself for her gloom of the night, based on nothing more tangible than a sense of condemnation under an arbitrary law of society which had no foundation in Nature” (279). Tess realizes the fickle nature of man-made laws and systems and chooses to subvert their wishes. She can see the expansive reach of the centralizing force of normative Victorian marriage and consciously places herself outside of its concentric grasp; in doing so, Tess resists being trapped by unproductive narratives of purity and, instead, embraces liberation and entropy as she charts her own course.

The role of religion as a faulty center is clearly seen in Angel’s adolescent argument with his father. Angel defends his choice not to enter the ministry by saying,

My whole instinct in matters of religion is towards reconstruction; to quote your favorite Epistle of the Hebrews, “the removing of those things which are shaken, as of things that are made, that those things which cannot be shaken may remain.”

(116)

The use of Paul’s own words to explain Angel’s division from the faith rather than adherence to it is a means of deconstruction far more than reconstruction. Referencing Hardy’s religious ambivalence, Uttama writes, “In the absence of divine Providence, Tess’ tragedy is more a product of chance than fate and predestination because these two words are redolent of religious and supernatural denotation” (Uttama 33). If Angel is meant to share Hardy’s views, the “things which cannot be shaken [and must] remain” (116) are subject to chance; these could just as easily have been the tenants that are shaken and removed. For Hardy, there is no center that is constant and unchanging; chance has the ability to alter what is viewed as Truth. This is true of reality, both past and present. As more is learned, the shaky foundations are replaced by stronger ones, but entropy warns us against becoming too comfortable with any one representation of



reality. What stands now will always shatter in the face of what is next, and Hardy proves this with the countercultural examples of Tess Durbeyfield and Angel Clare who are initially presented as uncentered and revolutionary by Hardy and continue to be reinterpreted through time.

### **The Compulsion to Repeat Versus Revolution**

In 1914, Sigmund Freud published a new psychoanalytic strategy called “Remembering, Repeating, and Working-Through” in which he focuses on patients’ compulsions to repeat primal scenes, often of trauma, from their early childhood. These scenes remain subconscious in their minds, but the individual is kept fixated upon them and repeating the same actions and feelings without realizing it. Freud offers that, by uncovering and working through these compulsions to repeat, one can instead come to an impulsion to remember; past events in one’s life become useful informants on how to move forward rather than be continually constrained (Freud 154). Victorian novels deal intimately with this compulsion to repeat, especially given many of these works are bildungsromans for young female protagonists.

Yevgeny Zamyatin’s 1923 essay entitled “On Literature, Revolution, Entropy, and other Matters,” argues entropy and the changes it brings are necessary for new, youthful ideas to change society for the better. He calls for a revolution, for a “literature that is alive... not by yesterday’s clock, nor by today’s, but by tomorrow’s” (Zamyatin no pagination), and a climate where being wrong matters much less than never stepping out to desire something new. Zamyatin calls negative entropy a “sleeping sickness” and warns writers against “sink[ing] into satiated slumber in forms once invented and twice perfected” (Zamyatin no pagination).<sup>7</sup> Interestingly, the Greek lexical unit of the word entropy means “rotation” (Razumovskaya 263),

Where there tend to be compulsions to repeat or rotate around a faulty center, entropy, instead, calls for revolution and turning the norms of the times on their heads. While individual instances of revolution are exemplified in these texts, the ultimate literary revolt is the adoption of realism, which entropy readily supports.

The compulsion to repeat abounds in *Bleak House*; Esther's earliest childhood memories become primal scenes that shape her existence and desire to be loved and known. Esther's godmother instills the power of fate and lack of opportunity for revolution in her from the beginning. "Your mother, Esther, is your disgrace, and you were hers," (30) she tells the child. She goes on to allude to the Biblical ramification for sins of the Israelites found in Numbers:

For yourself, unfortunate girl, orphaned and degraded from the first of these evil anniversaries, pray daily that the sins of others be not visited upon your head, according to what is written. (30)<sup>8</sup>

It takes a process of positive entropy, of dismantling these harmful ideologies about Ester's worth and ability to be loved, that spans the entire novel, but Dame Durden eventually finds a guardian who can never forget her or wish her better off dead, a husband who blesses her and the sick and poor around him, and winds that "have never [been] known... to be in the East for a single moment since the day [Mr. Jarndyce presented her with Bleak House]" (988). Importantly, this is not simply a concise ending,<sup>4</sup> but rather a beginning for a more realistic foundation of Esther's worth and her integral role in the lives of those around her. Richard Carstone gets a similar ending in that he is freed from his compulsion to repeat, bound to the Court of Chancery's evil uselessness. Upon his deathbed, Richard speaks of "begin[ning] the world" (979), this time with revolutionary ideas about what is possible; "I will not begin it in the old way now," said

Richard with a sad smile. ‘I have learned a lesson now, sir. It was a hard one, but you shall be assured, indeed, that I have learned it’” (978). Richard has learned the trap of negative entropy and the calamity that follows putting all of one’s trust in any one thing, no matter how good it may seem. Rather, entropy calls us to tread lightly, to accept but not always internalize, and to reject absolute completion whenever possible.

Rather than continually rotate around a faulty center, it is important that things continue to evolve and differentiate, a theme echoed by *Our Mutual Friend*. In one specific example, Lightwood and Wrayburn imagine themselves trapped on a rock at sea during a storm and argue whether they would be bored by lack of work. “...but it would be a defined and limited monotony” says Wrayburn, “It would not extend beyond two people. Now it’s a question of mine, Mortimer, whether a monotony defined with that precision and limited to that extent, might not be more endurable than the unlimited monotony of one’s fellow-creatures.” (148) Lightwood and Wrayburn are disheartened by their continuous work and the compulsion to repeat each passing day like the last. Their praise for limited monotony of only a few, rather than the unlimited monotony of the masses, has all the tenets for a call to revolution such as Zamyatin’s. While order may increase in one small space, it must bring about with it an increase in the overall disarray of the atmosphere. Monotony is bearable when it has a promised end in eradication, upheaval, and revolution. However, this end in revolution is most often an illusory promise. The realistic conclusion is that most things change very slowly, but even the slowest progress matters. It must matter, or the unlimited weight of monotony is too much.

Victorian novels are invested in this change, no matter how slow the progress. The longing for eventual revolution abounds in these works, each with their own form and meaning.

Brattin cites three forms of revolution as paramount in Dickens' novels: the Industrial Revolution, social revolution, and the revolution of Esther Summerson's character in *Bleak House* (Brattin). As Esther's (r)evolution has already been discussed, here, focus is shifted to Dickens' want for the upheaval of the Victorian city existence, especially of the aloof rich, for a more authentic connection to others and a true presentation of the world as it stands. Both *Bleak House* and *Our Mutual Friend* make explicit reference to Wat Tyler's peasant revolt of 1381. In *Bleak House*, Sir Leicester Dedlock is uncomfortable with, not only the Industrial revolution, but particularly a social and political revolution he fears will come Mr. Rouncewell's son, named Watt. In the first edition, Watt is spelled with only one "t" pages after a moment where "Sir Leicester has a misgiving that there may be a hidden Wat Tylerish meaning in this expression, and fumes a little" (740). Just as entropy sends waves of change over time, the spelling has been corrected to Watt in more modern editions. However, the misspelling is reflected in Dickens' original manuscript, and whether it was an unintentional error or not, the difference serves to highlight the connection of this minor character to revolution and the discomfort of the Victorian aristocracy with long overdue change.

In *Bleak House*, Dickens' most obvious call for this social upheaval follows the death of the beloved orphan Jo. On his deathbed, Jo tells Mr. Snagsby of the "do gooders" like Mr. Chadbands and Mrs. Pardigle who go to Tom-All-Alone's to help the poor and spread the gospel, but their actions hold no real worth and their words fall on uneducated, confused ears. Jo says, "We never knowed nothink. I never knowed what it wos all about" (753). The unfortunate boy dies with the Lord's prayer on his lips, never making it to the end of the phrase "Hallowed be thy Name" because, in the eyes of Victorian culture, Jo had no name, akin to his deceased friend and protector, Nemo. The philanthropists of London society care for the poor only as

much as it is convenient for them. There is no desire for a revolution because it will cause shifts and discomforts in their own lives as well. This chapter ends with Dickens' assessment:

Dead, your Majesty. Dead, my lords and gentlemen. Dead, Right Reverends and Wrong Reverends of every order. Dead, men and women, born with Heavenly compassion in your hearts. And dying thus around us, every day. (734)

Dickens calls out to, not only the characters in his novel who never do anything truly helpful for the poor, but also to the readers of the Victorian era. This passage holds an exigent connection to the present as well. The wide range of lords, gentlemen, reverends, and compassionate mankind Dickens summons, even so far as to cross the boundary from the fictional to real world over one hundred years, testifies to the pervasive, entropic, realistic nature of yearning for change. Universally, the call to improvement is the same; busyness means nothing if it carries a savior complex and fails to truly reach the people it is aimed towards. Entropy requires that actions will always spread. Taken to the fullest advantage, this truth allows one to impact countless lives like those of Jo and the people of Borrioboola Gha positively. In the wrong hands, this influence can be detrimental. Through critical examination, we are able to discern the diffuse effects of our own actions and vow to propagate good over uselessness.

Dickens again uses strong imagery in *Our Mutual Friend* to denounce the frivolous workings of the philanthropists and call for an upheaval of the poor house system when Mrs. Betty expresses her more than "dislike" (199) of such places:

Kill me sooner than take me there. Throw this pretty child [Sloppy] under carthorses' feet and a loaded wagon sooner than take him there. Come to us and find us all a-dying, and set a light to us all where we lie, and let us all blaze away

with the house into a heap of cinders, sooner than move a corpse of us [to the poor house]. (199)

Mrs. Betty would sooner face the blazing fire, drawing to mind images of the spontaneous combustion of *Bleak House*'s Mr. Krook, sooner than subject herself to the moral filth of those who claim to aid the poor. Here, thermodynamic death is regarded as a noble escape and a visible symbol of revolution rather than a punishment for immorality, as is the case with Chancery himself, Mr. Krook.<sup>9</sup> However, the conjecture of physical disintegration as a symbol of entropic erosion as well as an awakening against the well-worn footprints of the complacent rich in the poor sectors of London accomplishes its goal as a signal fire for change.

While Dickens calls for revolution in his works, using satire to highlight the damaging and decaying aspects of Victorian culture, Hardy places the act of revolution and subversion of societal norms at the forefront of his novels. In *Tess of the D'Urbervilles*, Tess' defiance of the Victorian views of purity, sexuality, and marriage, while not of her own initiation, acts as a revolutionary force. Angel's rejection of his father's religion does just the same. However, there is another less obvious reading of revolution in *Tess*. From the beginning, this novel is necessarily tragic, "as inevitable as the phases of the moon" (401). Not only does this reference to planetary motion imply that the laws of science are dependable, but it also offers an avenue through which to explore tragedy as cyclic. In the context of compulsion to repeat, the center of *Tess* is chance, which destabilizes the system and creates instead a compulsion to disorder and opportunity for revolution.

Within Tess' family history, readers are presented with the idea that this compulsion is bound by fate. The novel's opening finds Parson Tringham telling John Durbeyfield of his

ancient relations. After inquiring after his family members who are “gone under” and lie, “rows and rows of [them] in [their] vaults”, Durbeyfield asks, “And what had I better do about it, sir?”. The parson replies, “Oh — nothing, nothing except chasten yourself with the thought of ‘how the mighty have fallen’” (9). This exchange shows the inevitable loss of greatness and the acceptance of entropic reality that is necessary to exist as a Durbeyfield, once D’Urberville. Tess cites the compulsion to repeat for her disillusionment with education:

Because what’s the use of learning that I am one of a long row only— finding out that there is set down in some old book somebody just like me, and to know that I shall only act her part; making me sad, that’s all. The best is not to remember that your nature and your past doings have been just like thousands’ and thousands’, and that your coming life doings’ll be like thousands and thousands. (126)

Early on, Angel admits he is surprised by Tess and the way she moves away from “her Sixth Standard training” towards the “ache of modernism” (124). However, in other moments, Daniel asserts that Clare, in taking up judging by science instead of religion, dismisses Tess because her lineage is an “exhausted ancient line” (260). Her moral impurity matters much less to him than the idea that her decaying lineage thwarts scientific progress (Daniel no pagination). After learning Tess has murdered Alec, Angel “look[s] at her as she lay[s] upon his shoulder, weeping with happiness, and wonder[s] what obscure strain in the D’Urberville blood ha[s] led to this aberration — if it were an aberration” (385). If it is true that Tess could not control her fate and was simply doomed to repeat the murderous compulsions of her ancestors, this runs counter to the ideas of randomness and chance that accompany entropy. The distinction here comes when Angel chooses the word “aberration” but wonders if it is an appropriate description. Synonyms of aberration include “disorder” and “instability”, and the definition of the term when applied to

physical subjects like optics is “the failure of rays to converge at one focus because of limitations or defects in a lens or mirror” (Oxford Languages). Angel’s uncertainty about this word choice indicates his skepticism of the role of fate in Tess’ choices. He finally sees that it is also just as probable that her actions are independent of any hereditary power; they have simply unfolded by the work of chance in Tess’ life that leaves her raped by Alec D'Urberville to begin with. In this comparison of fate and chance, Hardy paints Tess as a pillar for social progress, so much so that she must pay for her subversion of the decaying moral system with her life. Her actions attest that new life and needed change can come from washed up families, proving that mindless adherence to ideas of fate and the impossibility of change are both anti-entropic and unrealistic.<sup>10</sup>

Entropy, and thus real life, necessitates the possibility of continually evolving change. There is no allowance for stagnation in a world governed by the chaos of shifting energies. This is precisely the larger idea; our reading and interpretation of literature is this mirror by which we understand the worlds both written about and our own. Entropy limits our perfect understanding of and convergence on one set of opinions just as it scatters beams of light. Our interpretation of literature is faithful to physical phenomena that happen at the atomic level. It is, in its purest sense, real, and the unending passage of time brings new interpretation as circumstances wax and wane like the cyclic phases of the moon.

## **Conclusion**

Ultimately, the truths revealed here regarding lack of a definable center and the connected yet distinct ideas of compulsion to repeat and revolution point to the very heart of the idea of entropy. This thermodynamic principle works in all things, even those not deemed inherently “scientific”, at a level that is not always easily detectable, but it is essential for both the survival of humanity and its eventual end. Authors of Victorian realism share their characters and worlds,



fictional yet representative of authentic life, with readers, and, by doing so, help parse out ways to exist in naturally entropic spaces. When a work ceases striving against entropy and instead leans into the mutability of all things, it garners validity. Fighting tirelessly to keep the pieces together is a well-known emotional and physical toll of the universal human experience. In *Our Mutual Friend*, Wrayburn grapples with the same fatigue from the fight. When asked about his love for Lizzie Hexam, Wrayburn replies,

‘What can I do more than tell you all I know, and acknowledge my ignorance of all I don’t know! How does that little old song go, which, under pretense of being cheerful, is by far the most lugubrious I ever heard in my life?

*“Away with melancholy,  
Nor doleful changes ring  
On life and human folly,  
But merrily merrily sing  
Fal la!”*

Don’t let us sing Fal la, my dear Mortimer (which is comparatively unmeaning), but let us sing that we give up guessing the riddle altogether.’ (292).

Rather than choosing one stance and deciding that the riddle is either melancholic or cheerful, Wrayburn and Lightwood come to the entropic conclusion to give up the idea of definitively solving the riddle altogether. Not only is this easier for the human spirit to bear, but accepting the impossibility of only one solution is a necessary step towards revolution. The more we admit what we don’t know, the freer we are to keep deconstructing and looking. Education and catechism in the Victorian era focused on the power of the schoolmaster to produce consistent, standardized answers from their students.<sup>11</sup> The expectation to have a complete answer rehearsed and ready for every situation both stifles

creativity and possibility and creates fear around thinking the “wrong” things. To the contrary, entropy, and its expression through Victorian literature pushes back against the catechism and shows it is, in fact, not detrimental, to live with unanswered questions. Unresolved ideas leave room for the entropy of free thinking and, ultimately, the propagation of hope.

Understanding the influence of scientific entropy on a field such as literature offers an alternative epistemology for the human experience and provides resolution and solace in the inability to know all the answers. Here, the answer to all questions is that everything changes, and not a single one of us is exempt from the entropic workings of chance. Rather than causing dejection, this should inspire encouragement; we learn from Hardy that real life never promised much, “just neutral tinted haps and such” (Hardy). While the light ultimately fades, so must the vast grays dissipate into the ether; “So do flux and reflux — the rhythm of change — alternate and persist in everything under the sky” (Hardy, *Tess* 351).

### Endnotes

1. While not focused on in this analysis, other Victorian texts including Eliot’s *Middlemarch* are riddled with elements of entropy. See, for example, the earlier text on page 838 where Eliot mentions acts of Dorothea’s life that “were the mixed result of a young and noble impulse struggling amidst the conditions of an imperfect social state” and the influence of “what lies outside” on individuals.

Entropy is an outside force that necessitates the aforementioned “mixed result”.

2. In Coleridge's "The Eolian Harp", nature can play melodies in the mind of the keen observer. Nature, as the force which rolls through all things, points to entropy as it is described in line 45 as "organic haps diversely framed".
3. See, for example, "When I have fears that I may cease to be" with its references to the "magic hand of chance" (line 8) and the entropic way in which "love and fame to nothingness do sink" (line 14). Prevalence of the same ideas, which can be related to entropy, in Romantic works penned before "entropy" became a word only emphasize the universal, nuanced, yet identifiable nature of the scientific laws.
4. As discussed during the presentation of this research at the 2022 Kemp Symposium, entropy studies explain why we often perceive happy, neat endings as unfulfilling. Even if it is unconscious to us, our minds understand that such endings are contrary to the laws of entropy and cannot accept them as aesthetic reality.
5. Syd Thomas' "'Pretty Woman, Elegantly Framed': The Fate Of Bella Wilfer In Dickens's 'Our Mutual Friend'" expounds upon Mr. Venus' job of articulation as a manifestation of "male's insidious assertions of power over feminine will" (5). In a similar manner, Harmon exercises articulatory control over Bella and misses what he married her for by diminishing her to an object of his power.
6. "The evil that men do lives after them;/ The good is often interred with their bones" (Julius Caesar, III.ii. 75-76), quoted from *Our Mutual Friend*, Notes by Adrian Poole.
7. Angel's account of his brothers' education (see pg 159) reflects Zamyatin's argument. Acceptance of "popular" and canonical works with no inclination towards change or progress is associated with "growing mental limitations" (159).

8. Where “what is written” refers to “Visiting the sins of the fathers upon their children unto the third and fourth generations” Number 14:18 (from *Bleak House*, Notes by Nicola Bradbury).
9. For more on Mr. Krook and his rag and bottle shop as disintegrating, grotesque representations of the Court of Chancery, see Kay Hetherly Wright’s “The Grotesque and Urban Chaos in *Bleak House*” and Brooke D. Taylor’s “Spontaneous Combustion: When “Fact” Confirms Feeling in *Bleak House*.”
10. Mary Rimmer’s “Troubling the Tragic Paradigm: Genre and Epigraph in Thomas Hardy’s *Tess of the D’Urbervilles*” offers a reading of the novel’s epigraph as one with the “inability to contain Tess’ story” due to fragmentation, destabilization, and “a certain slippage of Tess out of the paradigms that structure her” (392). This reinforces the notion of entropic revolution as a breakaway from cyclic, fated tragedy.
11. See, for instance, subversions of the catechistic method in Wordsworth’s “We Are Seven”. The young girl refuses to accept the schoolmaster’s limited, black and white view of the line between living and dead. She continues to interact with the memory of her siblings rather than leave them dead in the churchyard. In another instance in *Tess of the D’Urbervilles*, Angel Clare similarly rejects the education system and catechism: “Considering his position he became wonderfully free from the chronic melancholy which is taking hold of the civilized races with the decline of belief in a beneficent Power. For the first time of late years, he could read as his musings inclined him, without having any eye to cramming for a profession...” (118). Moreover, in *Our Mutual Friend*, John Harmon destabilizes the catechism when he answers as John Rokesmith to Bella’s questioning (670).

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I hereby declare upon my word of honor that I have neither given nor received unauthorized help on this work.

*Hannah Harris*