Love, Death, and Thermodynamics: The Entropy of Myth in *The Only Jealousy of Emer* by W. B. Yeats

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Abstract

Since the days of the ancients, Myth has occupied an important place in the society. It has had a sociological function and has served as a standard for what is perceived as the norm. Given its pre-conceived nature as a paradigm for proper human behaviour, it tends to be rather linear and thus, can be interpreted through quantifiable criteria. For this study, myth is interpreted through the laws of thermodynamics. The subject of scrutiny is W. B. Yeats's *The Only Jealousy of Emer,* a play based upon the Ulster myth of the demi-god Irish hero Cuchulain. As the play is rooted in a famous mythological narrative, it serves as a microcosm that offers a thermodynamic reading. The play is analyzed in terms of the first law of thermodynamics, thermal expansion, and the second law of thermodynamics, in that order. The research proposes that *The Only Jealousy of Emer,* under the laws of thermodynamics, functions as an isolated system, wherein the total internal energy of the system remains the same. It also analyzes thermal expansion taking place within the same isolated system. Finally, it concludes with a theorization of myth, postulating that as per the second law of thermodynamics, myth as an isolated system is constantly moving toward a state of interpretational stagnation and thermodynamic equilibrium, and utilizes Yeats's play to demonstrate the idea.

Keywords: myth, thermodynamics, thermal expansion, thermodynamic equilibrium

Joseph Campbell, when asked why one should care about myth, an obsolete device, in the modern era, gave an interesting answer. In his opinion, myth is ever pervasive in our lives, shaping minds and perspectives. It is mimetic of life and deals with "deep inner problems, inner mysteries, inner thresholds of passage", and reveals "information of a deep, rich, life-vivifying sort" that helps one navigates cultures and traditions (Campbell *The Power of Myth* 16).

But what is "myth"? Campbell seems to think that it is a building block of civilization, and the *Dictionary of English Folklore agrees.* It defines "myth" as

> stories about divine beings, generally arranged in a coherent system; they are revered as true and sacred; they are endorsed by rulers and priests, and closely linked to religion. (Simpson and Roud 254, emphasis added).

Narratives of myth have a function to perform, a function that is sociologically and morally grounded in the foundation of civilization. It provides a precedent to be acted upon and shapes subsequent human action, what Frye calls "facts of primitive social life and ritual" ("Four Ages" *Biblical and Classical Myths* 276). A big fan of the mythical, the macabre, and the magical, W. B. Yeats wrote seven plays, later called his "Cuchulain plays", that derived their sources from the Irish myth, and depicted existential and psychological issues through gods, demi-gods, and demons. They follow the famed Irish hero Cuchulain, a demi-god from the Ulster Cycle of Irish mythology, and portray his eternal battle with evil in a series of settings and situations. The Ulster Cycle is one among four "cycles" of "Irish epics" that are "preserved in various medieval manuscript compilations" (Aitchison "The Ulster Cycle" 1). They have an episodic

structure, sometimes associated and often standalone, and feature both gods and men as their protagonists. The progression of events is linear, dealing with the central hero's conquests and personal battles. Many of Yeats' plays derive their subject matter from ancient Celtic mythology.

One of his seven Cuchulain plays is *The Only Jealousy of Emer* (1919), selected for this study. It is the fifth in the chronology of Cuchulain plays. It is rich in its setting and costumes and borrows from the Japanese theatrical tradition of *Noh*, popularized by Zeami in the Muromachi Period (1333-1573). Made an official art form by the shogunate in the Tokugawa Period (1603-1867), it is a ceremonial theater focused around song and dance, with heavy costumes, monotonous dialogue delivery, and borrowing its plot from historical tales of kings, supernatural entities, and demons *(Japan Guide* "Noh Theater" par. 4).

The Only Jealousy of Emer is a product of Yeats's convictions about history, human personality, and the supernatural world, which he then arranged into a philosophical system (Taylor 78). It is a dive into the recesses of the human mind, supplemented by heroes from Yeats's native Ireland, and is primarily about "the ambiguity of love, of individual incompleteness and the need for fulfillment by uniting with a complementary being outside oneself" (79). As explored later in this study, the play takes the eternal struggle of life and death as its central theme, and searches for an answer to persistent problems plaguing the human condition. In the play, "the opposing forces of life and death, spiritual and physical, abstract and concrete, eternal and ephemeral, are all locked in an everlasting struggle" (Knapp "An Alchemical Brew" 448).

The primary purpose of this study is to read Yeats's play and the mythological narrative at large, as an isolated system that cannot exchange either matter or energy with its surroundings *(Khan Academy* par. 2). This can be further narrowed down to its thermodynamic application, which entails that an isolated system is one where mass or heat energy cannot be transferred outside of the boundary, but the items inside can exchange energy with each other. As such, this study looks at myth as an isolated system, a rather insulated narrative of social values and norms.

To supplement this view, recourse must be made to Mircea Eliade, for whom myth exists in a religious context, and that for traditional societies, history was "absolutely true" and "sacred" because it comprised the "acts of the Supernaturals" *(Myth and Reality* 18). Donald Mills concurs, stating that for archaic societies, superhuman heroes took the paradigmatic first steps that established all "subsequent patterns of meaningful human activity" *(The Hero and the Sea* 12). For Yeats, particularly in *Emer,* the hero Cuchulain sets a standard of action: by fighting the eternal force of Sea, he teaches a lesson in human fragility to those of us seeking to "transcend the human condition" (Knapp 3). What one gleans from this story is this: if a god-born could not prevail over nature, how can an ordinary mortal win?

To further consolidate the view of myth as an isolated system, the play acts as a cautionary tale, creating a binary of here/beyond, elaborating on the view of traditional societies that "conceived their world as a microcosm" believing that "beyond the boundaries of the closed and finite world of human experience lies the domain of the unknown, the formless, the chaotic". On this side of the divide, there is "ordered space",

of "predictability, familiarity, and order". It is the space where the normal exists. The other side is darker, marked by "disorder, strangeness, and chaos", plagued by demons and specters (Mills *The Hero and the Sea* 12).

In that sense, non-permeable boundaries are created between the spiritual world and the human world, similar to that of an isolated thermodynamic system. Interaction is possible between the subjects in either realm, but the boundary cannot be transgressed. Northrop Frye makes a similar argument when he describes the basic structure of most myths. According to him, there are only a few kinds of plots that all myths follow and as such, they are founded upon binaries of "creation, transformation", "love, loss", "disappointment, and success" ("Four Ages" 277). The setting for these plots is also binary, either "the heavenly world above" or "the underworld". The earth too is either "paradisal and unspoiled or ravaged by greed, pride, and war" (278). There is a clear physical divide and a delicate balance that must not be tampered with. This is the major takeaway from all stories of the occult; man must not tamper with universal balances.

A common counterargument to the isolated nature of myth is the chaos motif, "the regression of all forms to the indistinction of the *materia prima* (primordial matter)" (Eliade 190). The chaos motif features in *Emer* in the form of "the deathless sea" (Yeats "The Only Jealousy of Emer" *Collected Plays* 186). Eternal and unpredictable, it arguably throws off the predetermined balance of the narrative. However, despite its nature, it is essentially a stable component of the narrative. According to Donald Mills, in narratives of myth, chaos is configured as a "positive force with inherent patterns and predictabilities" *(The Hero and the Sea* 161). The ancients saw some value in human

effort, believing it is possible to trump the unpredictable forces of nature and "to frame a coherent model of the universe", with which they "hoped to confront crucial problems of human existence" (161).

He goes on to cite Nina Hall, who agrees that by examining chaos as symbolic of human struggle for control over the elements, one can "link everyday experiences to the laws of nature by revealing, in an aesthetically pleasing way, the subtle relationships between simplicity and complexity and between orderliness and randomness" *(Exploring Chaos* "Introduction" 6). Thus, a preconditioned pattern is revealed in seeming randomness, which lends even more conviction to the idea that myth is indeed a system of fairly unshakeable nature, comprised of social mores, values, and ethics.

Having thus established the foundational thesis of the research, this study has attempted to adapt the thermodynamic systems, and two of the laws of thermodynamics, to the structure of myth, particularly in W. B. Yeats's *The Only Jealousy of Emer,* on the grounds that it is linear and exists in an isolated system of social values that are projected upon the text by the author/initial teller of the myth. It attempts to achieve the following objectives:

1. By the first law of thermodynamics, examine Cuchulain's struggle with the water and subsequent death as taking place in an isolated system, wherein both opponents' heat energy comes from within the system and is conserved in the following ways: it exists as the trapped ghost of Cuchulain in the water's depths and births Fand, as a malevolent force that wishes to keep the ghost in the water;

2. Examine the triumph of life over death in an isolated system (the cabin), which utilizes heat generated within the system as a catalyst for thermal expansion (Emer's consciousness expands and forces her to make a decision);
3. By the second law of thermodynamics, analyze the play as an isolated system moving toward thermodynamic equilibrium. In a wider context, the mythological narrative can be similarly interpreted.

Ultimately, this framing allows the reading of the text as a myth that is slowly moving toward a thermodynamic equilibrium as per the second law of thermodynamics. In a more concrete sense, the study proposes, through the micro-perspective of the play, that myth itself is a narrative that will acquire thermodynamic equilibrium, as it is an isolated system, and will at some point be so saturated with interpretation and re-interpretation that no further interpretation will be possible. The re-telling and re-interpretation are taken to be work and heat in this situation that generates entropy, exhausting all possible explanations of the story. As an isolated system prevents exchange with its surroundings, myth is taken to function in a similar manner.

The play begins with the explosive action that has already taken place. Enraged by a young stranger's provocation, Cuchulain kills him in a duel underneath Baile's tree, only to find out later that it was his estranged son, borne him by "some wild woman when he was young" ("Emer" 186). Upon this revelation, he goes "mad with sorrow", desperately seeking an outlet for his frustration, which he finds in the Sea. He "fought the deathless sea" (186), as the rest of his men watched. Eventually, he was defeated, his body swept up by the waves and tossed back upon the shore, dead.

According to this progression of events, the first reaction has already taken place under the first law of thermodynamics that, in simple terms, adapts the law of conservation of energy to a thermodynamic system, stating that the net heat energy in an isolated system is not destroyed, and remains constant. The equation is constructed as follows:

$\Delta U = Q - W$

Where Q is the heat energy of the system, U is the change in the internal energy, and W is the thermodynamic work done by the system (Mandl *Statistical Physics* 30). Thus, the total change in the internal energy of a system is equivalent to its heat energy and the work (force causing movement) done on it.

This equation, applied to the action taking place within the play, entails the following:

Q: Cuchulain's aggression and the water's unpredictability

W: Cuchulain disturbing and fighting the water

U: the entrapment of the ghost and the birth of Fand

In this situation, the system comprises the entire external world of the play, including the fisherman's cabin and the spiritual world (isolated systems in themselves), where the fight between Cuchulain and the Sea takes place. Since heat cannot be supplied from outside the system, it exists within the system in the form of Cuchulain's internal rage as well as the Sea's merciless nature. The play frequently hints at Cuchulain's nature, as well as his atrophied arrogance. "Yeats' Cuchulain is a man of instinct and prone to blind rages. He feels his way into events and situations. He acts and does not rationalize"

(Knapp 450). Once a hero with purpose and goodness, he has since degraded into an arrogant tyrant, owing to his unmatched strength.

He is, in this sense, a typical example of an over-powered hero, one that stagnates the story, because any idea of a threat is instantly diminished in the face of the all-powerful hero. Therefore, in order to convey a lesson in human arrogance and its pitfalls, he is pitted against the everlasting Sea, stronger and mightier than him. Cuchulain, therefore, is "that amorous, violent man" ("Emer" 185) whose actions are internal, rather than affected by the environment, and so is the Sea. The result of this battle is threefold: Cuchulain loses and dies; his spirit remains trapped in the netherworld of the water; a woman of the Sidhe, Fand, crosses over from the spiritual world into the human world.

The overall heat energy of the system is preserved: despite the spirit of Cuchulain being trapped in the water, Fand replenishes the loss, as she comes from "the country under the wave" ("Emer" 190). This occurs because the entire external world is an isolated system and the heat energy cannot permeate any other system. Further evidence of the conservation of internal energy comes from the fact that all three outcomes are linked by the metaphor of water, a totality of isolated systems and can be thus, interpreted as combined value Q in the equation.

For the value of W, the work done in the play is equated with Cuchulain's murder of his son and his subsequent disturbance of the Sea. Work as thermodynamics is defined as the "displacement" or "deformation" that occurs by means of a force field (Duthil "Basic Thermodynamics" 3), symbolized by the following equation:

$\delta WFx = \cdot d$

This suggests that productive work is done when force is applied to create change in a system by way of movement, either displacement or deformation. When Cuchulain kills his innocent son in a rage, he disrupts the natural law that does not permit the murder of an innocent. It is an action that can be visualized as deformation. His subsequent battle with the Sea can be interpreted as displacement, as he wades into the water, and the water sweeps over him ("Emer" 184). The first reaction, therefore, is complete.

The second reaction that bridges demonstrations of the first and the second laws of thermodynamics, is thermal expansion. It is a reaction that takes place in the fisherman's cabin where Emer has removed the body of Cuchulain. Thermal expansion occurs under the following formula:

$$\Delta L = \alpha L \Delta T$$

Where ΔL is the change in length L, ΔT is the change in temperature, and α is the coefficient of linear expansion, which varies slightly with temperature ("Thermal Expansion" Lumen). The setting of the cabin is also an isolated system with fixed boundaries. While external elements appear in the form of Bricriu and Fand, it can be argued that the system becomes isolated the moment Emer brings Cuchulain's body inside, a body already occupied by Bricriu and attracting Fand. The cabin is what Eliade calls the "sacred", a special area within the profane world where "dramatic breakthroughs of the sacred (or simply the supernatural-ness)" take place *(Myth and Reality* 6). Mills solidifies this abstraction by stating that these sacred spaces are embodied by places, "temples, mountains, and even cities… every place where the sacred bursts through into

the profane becomes a sacred center" *(The Hero and the Sea* 13). Thus isolated, the cabin takes on these qualities.

It is in this "closed and protective area" (Knapp 454) that an action symbolic of thermal expansion occurs: in order to save her husband's life, Emer is advised by the spirit occupying his empty body that she must renounce her love for him ("Emer" 192). This momentous decision, according to Bettina Knapp, will enable her "consciousness to expand" (458), in the sense that she will discard her original, reductive understanding of his character and accept other, darker facets of Cuchulain's personality. It suggests that

> objectification of feelings and needs is coming into being. Heretofore, Emer had never understood Cuchulain's shadowy nature. It had either remained invisible to her or she had repressed any knowledge of it. Now that Bricriu is concretizing it before her, she begins to understand the situation, and many learn to cope with it (Knapp 458).

As such, it can be inferred that the expansion coefficient in this situation is quite high. This is due to several factors. The first is Emer's stubbornness. She resolutely refuses to relinquish her love. As Fand emerges from the water, Bricriu warns Emer of her powerlessness in the face of the spirit "that has dreamed herself into the shape that he (Cuchulain) may glitter in her basket", emphasizing that Fand is an irresistible ideal and like all Sidhe, "[fishes] for men with dreams upon the hook" ("Emer" 190). Emer adamantly tries to attack Fand, but fails because she "has an airy body" (191).

A more literal explanation of the high coefficient is the fact that in order for

Emer to ultimately give in, no less than three sources of heat are present in the cabin; the literal fire she kindles in the hearth, Bricriu's constant warnings, and a romantic rival in the form of Fand. All three combined are responsible for Emer's surrender.

In order to proceed to the third reaction, conditions for the second law of thermodynamics, to take effect, must be studied. It requires an isolated system and the play's setting, as such, has been established. Mythological narratives at large, as isolated systems, have also been established at the beginning of this study. Another important precondition is an irreversible process "that can be assessed via a succession of thermodynamic equilibria by infinitesimally modifying some external constraints. It [cannot] be reversed without changing the nature of the external constraints, and only by reversing the parameters (such as time)" (Duthil 3).

Biological processes are often irreversible, including aging. For humans, the point of equilibrium is death, when a decayed corpse crumbles into dust (Coveney qtd. in Mills 165). For the purpose of this research, the reading of the mythological narrative of the play, through the ages, is also taken to be in such an irreversible state. It has a chronological structure, a fixed (moral/ethical) message to impart, and if read once, it will not be the same when read again. Simply put, the play is an isolated system with irreversible reactions occurring in it because its message is didactic, and the story offers a fixed ending, due to the aforementioned message. Arguably, it also means that the play offers a finite number of interpretations, contrary to other narratives.

The second law of thermodynamics, therefore, states that "during real (as distinct from idealized reversible) processes, the entropy of an isolated system always increases.

In the state of equilibrium the entropy attains its maximum value" (Clausius ver. Mandl 65).

$\Delta S_{systm} = \Delta S = \Delta S^{e} + S^{i}$

Where $\Delta S^{e} = \int \delta Q/T$ relates to the heat exchange and S^{i} is an entropy production term; for an irreversible process $S^{i} > 0$ (Duthil 5)

The entropy of a system is defined as the measure of the energy of a system that is unavailable for productive work. It characterizes the randomness quotient of a system. As entropy increases, the temperature increases, and the amount of work decreases until ultimately, the temperature is equalized, and the entire system falls into chaos. Chaos is understood to mean the unproductivity/saturation of the system.

With this in mind, the play as an isolated system generates entropy, i.e. further understanding, with each re-telling and re-interpretation. As the message is pre-determined and authorial intent is fixed, each new interpretation cannot venture far from the original context. With new readings, possibilities for further interpretation will continue to be exhausted until the over-saturation of the narrative. A point of fullness and thermodynamic equilibrium will thus be achieved. The chaos quotient of the play will be represented by its finite number of explanations. Each new interpretation will have to rely upon the old ones, and will remain confined to the isolated system of interpretation.

The structure of myth itself is being constantly subverted. In the age of postmodernism and beyond, there has been increased emphasis upon alternate readings, and hitherto concealed or illegible interpretations. Like biological processes, myth is

moving toward a state of thermodynamic equilibrium as well, a state of maximum capacity. This fullness may generate a new mythos; but as is commonly the case with most "new" mythos, they end up relying upon the age-old tradition established hundreds of years ago.

Regarding the nature of myth, one can even argue that it is a narrative where Laplace's demon can exist. There is a solid basis for that conclusion. For one thing, the world of myth is deterministic. The morally upright and precedential nature of the stories suggests a rather single-minded outcome. Each event in *The Only Jealousy of Emer,* and the plays prior and subsequent to it in the Cuchulain plays, begins at one point and progresses ultimately toward one conclusion. Even within the play, there is a move from Cuchulain's death to Cuchulain's rebirth, a linear process that is similar to Cuchulain's original story told in the Ulster tales. As the author, after concluding his story is aware of its beginning, middle, and end, as well as where future sequels will lead, the author occupies the role of an all-seeing God, a demon in this case.

It has to be noted, however, that the same cannot be said of all other narrative forms, precisely because other than a mythic narrative, it is impossible for other textual forms to achieve thermodynamic equilibrium, or equilibrium of any other kind. Myth is capable of such because it is a narrative rooted in tradition and religion. It preaches a pre-conceived message using larger than life heroes, and gods as actors, in order to set a precedent for human beings. In its original, primitive form that is quite well-preserved even today, myth is a deterministic system, ruled by a demon as its maker. It is often suggested, as with Frye, that in its initial stages, myth may have had a more arbitrary

meaning. It may have been mere stories of posthumous remembrance, tales of capricious gods, and just people trying to make sense of natural phenomenon (275-276). However, with the way popular myths are structured, it is clear that there is a bigger message to be exhumed from them. Issues of existential nature have plagued mankind for millennia. Even in a story as simple as that of Emer and Cuchulain, beneath the obvious love triangle, there lies a more potent problem. It is a cautionary tale by way of Cuchulain's end, who dares to battle an eternal force of nature. Despite being a celebrated hero, he is easily defeated and belched up on the shore by the all-powerful sea. His transgression is big enough that his wife is made to pay for it. The defeat forever taints their matrimonial bond.

Coupled with the laws of thermodynamics, an interesting pattern is revealed. As the entropy of interpretation increases in the overall mythical framework, the story itself is subject to the same result. In the end, there is no evolution in the character for Cuchulain. The only one whose consciousness, literally and figuratively, expands is Emer; she is forced to make a life-altering decision under severe duress. For Cuchulain, life remains the same. He is brought back to life and promptly embraces his mistress, Eithne Inguba. A "bitter reward" indeed ("Emer" 193), for the reader is able to tell that the unchanged Cuchulain will soon slip back into his old ways, seeking new mistresses, once he tires of Eithne Inguba, and continuing to be reckless. In his recklessness, he is even more prone to pick unbeatable adversaries. Thus, the cycle of anger and frustration is liable to continue until the eventual point of no return i.e total thermodynamic equilibrium.

The laws of thermodynamics are one lens to examine the complexity of myth in this manner. Following this pattern, many more scientific lenses can be developed to comprehend and even re-work ancient stories. The rationality of a scientific framework, combined with the abstraction and moral instruction of myth, has the potential to unveil challenging modes of analysis.

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