

# **“Unweaving the rainbow”: The semantic organization of the lyric**

JAMES CARNEY

## **Abstract**

*This article develops a semantic model of lyric poetry using the mathematical resources of René Thom’s catastrophe theory. In doing this, its central aim is to show that the semantic organization of the lyric can be understood as an embryonic articulation of the basic actional competencies that underwrite narrative expression. In terms of detail, the model shows that any lyric can be conceived as a system involving three macro-structural components (the speaker’s consciousness, an indifferent or hostile environment and a desired object) whose reciprocal interactions define what Thom identifies as a cusp catastrophe. In turn, this catastrophist system is shown to correspond with A. J. Greimas’ notion of a narrative program, and thus narrative is identified as the superimposition of numerically different lyrical trajectories upon one another. The end result of this is a revised understanding of lyrical semantics that postulates a commonality in how both lyric and narrative refer to world.*

“Philosophy will clip an Angel’s wings,  
Conquer all mysteries by rule and line,  
Empty the haunted air, and gnomed mine –  
Unweave a rainbow ...”

(II.234–7, John Keats, “Lamia”, 2001)

## **Introduction**

Although the historical evolution of the lyric has made it notoriously difficult to characterize what, precisely, this genre of poetry involves, Paul Ricoeur offers something approximating to a definition in *Time and Narrative* when he suggests that the lyric can be thought of as a metaphorical counterpoint to narrative expression. For Ricoeur, the lyric, as the static expression of a “cos-

mic pathos" (Ricoeur 1984: 81) that deplores "the brevity of life, the conflict between love and death [and] the vastness of a universe that pays no attention to our lament" (Ricoeur 1988: 273), necessarily contrasts with narrative, which is "grounded in a pre-understanding of the world of action, its meaningful structures, its symbolic resources, and its temporal character" (Ricoeur 1984: 54). This is not to say, however, that Ricoeur holds the two genres to be mutually exclusive. In his estimation, the pathic dimensions of narrative and the dramatic features of the lyric ensure that the "frontier between these two functions is unstable" (Ricoeur 1984: xi) – an assertion that he amplifies in his claim that "metaphorical redescription and mimesis are closely bound up with each other, to the point that we can exchange the two vocabularies and speak of the mimetic value of poetic discourse and redescriptive power of narrative fiction" (Ricoeur 1984: xi).

Insofar as Ricoeur is correct in his identification of these continuities and divergences between narrative and lyrical modes of expression, it would seem that further investigation of how these two genres relate to each other would be of obvious benefit to the broader field of literary semantics. In particular, it is likely that any sustained comparison of lyric and narrative would do a great deal to augment current understandings of the lyric, which, although taxonomically rich, are structurally quite poor when it comes to accounting for the organization of semantic content. Unlike narrative, where both rhetorical and semantic structures have been the objects of sustained critical inquiry, most extant studies of the lyric restrict themselves to the enumeration of the formal devices and thematic preoccupations that purportedly characterize the genre. The problem with this, of course, is that it leaves the semantics of lyrical expression completely undetermined. Like narrative, it cannot be doubted that the lyric is in some way congruent with human imundation in space and time, but what is less clear in the case of the lyric is the nature of this congruence. Consequently, it follows that the identification of any commonalities in how narrative and the lyric organize content should go some distance towards resolving the question of how the lyric imposes structure on experience.

In the present article, I will attempt to develop a semantic model of the lyric that reflects these projected commonalities between lyrical and narrative modes of expression. Although this model will take its point of departure from those aspects of Ricoeur's work discussed above, it is only fair to acknowledge from the outset that its actual substance will draw upon an analytic tradition that is significantly at odds with Ricoeur's humanistic commitments. Specifically, in constructing this model, I will utilize the mathematical resources of René Thom's catastrophe theory. While it is readily acknowledged that the initial identification of catastrophe theory as a global paradigm for mathematical modeling in the humanities was a little peremptory, it is nevertheless the case that the application of catastrophe theory to linguistics and semiotics continues

to generate some interesting results. In particular, figures such as Jean Petitot (1989, 2004), Franson Manjali (1991) and Wolfgang Wildgen (1982) have all shown how the elementary forms of morphogenesis – the ‘catastrophes’ of the theory’s title – can be used to understand how the discrete articulations of meaning emerge from the continuous data of sensory experience. Following these thinkers, I will argue that catastrophe theory has a great deal to offer when it comes to illuminating the intersections between the semantics of the lyric and the semantics of narrative. To be more precise, I will suggest that the lyric, in its charting of the reciprocal interactions of the speaker’s consciousness, a desired object and an indifferent or hostile environment, reproduces the dynamics of a one-variable, two-parameter catastrophist system; and that in doing so, it partitions the semantic substance of the poem into discrete regions that are linked by discontinuous transformations. The significance of this, of course, is that it immediately announces an affinity between the semantic organization of the lyric and the equivalent organization of narrative. As A. J. Greimas observes: “Narrativity, considered as the irruption of the discontinuous into the discursive permanence of a life, a story, an individual, a culture, disarticulates that discursive permanence into discrete states between which it sets transforms” (Greimas 1987b: 104); and to this extent, it is clear that the demonstration of any similar dynamic at work in the lyric shows the two genres to have a common structure. On the basis of this commonality, what I will show is that the successful or abortive movement from contemplation to projected action in the lyric reproduces the basic actional stance that underwrites all forms of narrative expression. What this will involve, in effect, is demonstrating that the lyric charts the embryonic activation of the agentive competencies that underwrite more complicated forms of narrative praxis. Thus, what this analysis should ultimately provide is a new understanding of the semantics of the lyric, in which the referential power of both lyrical and narrative modes of expression are shown to derive from their common encoding of the structures of space and time.

Before moving on to the analysis proper, however, it is perhaps worth making two final points. In the first place, it needs to be noted that although my aim is to identify a shared system of semantic organization in both lyrical and narrative modes of expression, my main focus here will, for reasons of space, centre on the lyric. Consequently, it will only be in the conclusion, when the catastrophist model of the lyric has been fully worked out, that I will return to issues of narratological significance. The second point of note is that much of the material below will obviously utilize the mathematical formalism of catastrophe theory. While this may initially seem off-putting to those who are not mathematically inclined, I would like to suggest that none of the mathematical material used below requires anything other than a reasonable familiarity with secondary or high school algebra and calculus. In any event, just to legislate for the possibility of this knowledge having been forgotten, repressed or never

learned in the first place, I will try to give intuitively accessible accounts of all relevant mathematical concepts as they are introduced.

## 1. The nature of catastrophist modeling

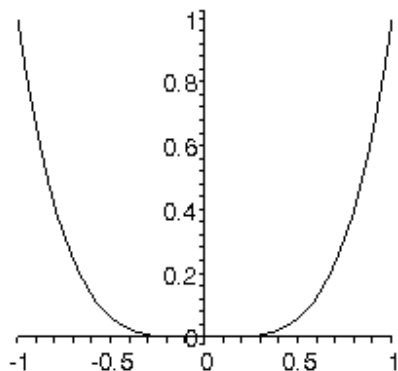
Now that the case has been made for a semantic analysis of the lyric based on catastrophist principles, the immediate imperative lies in initiating this analysis. In the present section, I will work towards this goal by giving a general outline of the basic precepts of catastrophist modeling. As this material will be largely introductory, readers who are already familiar with catastrophe theory can skip it without losing anything of importance; though it needs to be stressed for readers who are not familiar with catastrophist modeling that the succeeding sections will rely heavily on the concepts explored below. Once this introduction to catastrophe theory has been delivered, then the scene will be set for the two following sections, which will respectively derive a theoretical model of lyrical semantics and apply it to an actual poem – namely, W. B. Yeats’ “The Lake Isle of Innisfree” (1895). For now, however, the current need is to outline the general dimensions of catastrophe theory and its modeling strategies.

From this perspective, the first step in exploring the nature of catastrophist modeling involves giving a brief exposition on catastrophe theory itself, and explaining why it lends itself to the construction of semantic models. In this regard, catastrophe theory can be broadly identified as a branch of mathematics that seeks to classify the ways in which discontinuous changes can occur. Very generally, catastrophe theory attempts to classify on *a priori* grounds the different ways in which systems whose behavior is determined by finite number of variables can ‘jump’ from one type of stable behavior to another based on small changes in these variables. To this extent, catastrophe theory resembles contemporary chaos theory, which similarly seeks to chart how small variations in a control space lead to unexpected consequences; but it needs to be stressed that catastrophe theory, unlike chaos theory, is *qualitative* rather than *quantitative* in its orientation. Specifically, catastrophe theory is less concerned with measuring discontinuous changes than it is with identifying their morphology. The advantage of this is that it allows catastrophe theory to provide abstract models of how discontinuous changes occur that are not tied to any one empirical context. To this extent, catastrophe theory provides a model of morphogenesis that, in René Thom’s words, is “independent of the [material] substrate of the forms and the nature of the forces that create them” (Thom 1975: 8). In view of this emphasis on the qualitative aspects of discontinuous changes, it is perhaps unsurprising that catastrophe theory has been frequently identified as being particularly suited to the task of modeling the types of structure encountered in the humanities and social sciences. As areas of inquiry that resist the assigna-

tion of numerical measure to target data, it follows that any methodology that is sensitive to the qualitative as opposed to quantitative dynamics of structural systems can potentially offer a great deal to the human sciences. As Martin Golubitsky observes, “if one interprets the term [catastrophe theory] broadly [...] deep qualitative insights are to be discovered about a variety of problems” (Golubitsky 1978: 384); and insofar as Golubitsky is correct, there is thus an obvious case to be made for the utility of catastrophe theory in those areas that have traditionally resisted mathematization. It is for this reason that catastrophe theory is advocated here as providing a useful way of engaging with the semantic structure of the lyric. While it is only fair to concede that the application of catastrophe theory to these areas has stirred up its fair share of controversy (see Gardner 1978), it is equally the case that, as an example of one of those “hybrid discourses” that Jürgen Habermas identifies as “refusing to fall on either side of the dividing line between [science and philosophy],” catastrophe theory may well, in Habermas’ formulation, “stand for a type of approach that marks the beginning of new research traditions” (Habermas 1996: 248).

With the philosophical program of catastrophe theory now identified, the next step obviously comes with enumerating the practical details of how it proceeds. Specifically, there is a need to identify the mathematical infrastructure that catastrophe theory uses in the construction of models. (In view of the fact that this infrastructure is quite involved, only the broad outlines will be given here; for a more rigorous exposition, the reader is referred to Golubitsky [1978], Auer [1980] and Castrigiano and Hayes [1993].) In the first instance, catastrophe theory proceeds by classifying families of mathematical functions in terms of their qualitative behavior. Specifically, catastrophe theory derives a one-one correspondence between different types of non-equivalent, discontinuous behavior (catastrophes) and the members of a set of elementary functions (known as ‘germs’), and then classifies how these functions can be expanded (or ‘universally unfolded’) in a way that preserves the qualitative character of the relevant behavior in a number of mathematically specific ways. Put differently, what catastrophe theory does is identify a special class of functions (technically, those which contain what are known as *degenerate* singularities) and examine how their behavior varies in accordance with the values taken by one or more external parameters. An example should make all of this clearer.

Take the function  $F(x) = x^4$ . Considered on its own, this function has the relatively straightforward graph depicted in Figure 1. What interests catastrophe theorists, however, is the behavior of the function when two extra parameters  $u_1$  and  $u_2$  are introduced. This, for various technical reasons, gives the function  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  as the universal unfolding of  $F(x) = x^4$ . In this scenario, variations in the two parameters  $u_1$  and  $u_2$  will cause significant changes in the behavior of the function. Simplifying somewhat, for a fixed positive value of  $u_1$ , for example, varying the value of  $u_2$  gives three graphs for  $u_2 < 0$ ,  $u_2 = 0$  and

Figure 1. Graph of  $F(x) = x^4$ 

$u_2 > 0$  respectively (see Figure 2). In this scenario, as  $u_2$  ranges from a negative to a positive value, the morphology of the corresponding graph exhibits significant qualitative changes. As can be seen, a negative value for  $u_2$  gives a graph with one critical or turning point, putting  $u_2$  equal to 0 yields a graph with three critical points and assigning  $u_2$  a positive value again gives a graph with one critical point. Depending on the location of these critical points, they correspond to regions of either stable or unstable behavior in any system whose behavior is governed by the function  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$ . Specifically, the critical points in the graphs of  $u_2 < 0$  and  $u_2 > 0$  represent stable regions where the behavior of  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  remains in relative equilibrium, while the middle critical point in the graph of  $u_2 = 0$  represents an unstable region where a small change in the value of  $u_2$  is capable of causing the behavior of  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  to suddenly change into one or other of the behavioral states characterized by  $u_2 < 0$  and  $u_2 > 0$ . Thus, as the value of  $u_2$  continuously changes from a negative to a positive value, the behavior of  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  will change, in that one critical point will suddenly be replaced by another, with the point of equal attraction between both critical points being reached when  $u_2 = 0$ .

It is precisely at this point that catastrophe theory goes on to make the qualitative move of classifying the type of discontinuous change involved in a function like  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$ . In particular, by identifying the rates of change in the behavior of  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  as  $u_1$  and  $u_2$  vary, catastrophe theory becomes capable of identifying the general morphology of the discontinuous changes in functions whose behavior is governed by the behavior of two external parameters. As might be imagined, this is achieved by differentiating  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  and graphing the critical points of the resulting function (that is, those points where the resulting function equals zero). This gives  $\frac{dF}{dx} = 4x^3 - 2u_1x + u_2 = 0$  as the *catastrophe surface* of

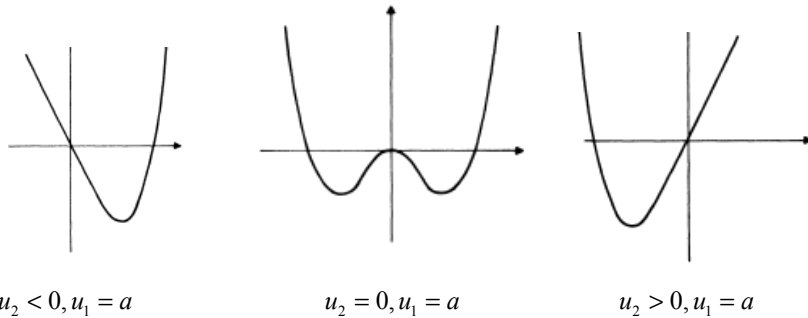


Figure 2. Graphs for the values of  $u_2$  (from Golubitsky 1978: 370)

$F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$ , which in turn yields the form depicted in Figure 3 when graphically represented. This morphology is known as the *cusp* catastrophe, and, as will be seen later, it is of central importance for the projected semantic analysis of the lyric. To see how this surface represents the behavior of the function  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$ , take the scenario discussed above of varying the value of  $u_2$ . Starting with a negative value for  $u_2$ , it can be seen that progressively increasing this value results in a situation where the system suddenly ‘jumps’ from one stable state to another (see Figure 4). Mathematically, this corresponds to the replacement of one critical point by another that is depicted in Figure 2, with the unstable critical point at  $u_2 = 0$  being represented by the underside of the fold. In this way, the cusp catastrophe allows for the identification of two stable states in any system whose behavior is governed by  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  – specifically, the upper and lower sheets of the catastrophe surface  $\frac{dF}{dx} = 4x^3 - 2u_1x + u_2 = 0$ . Thus, in any system of this type, there can only be two qualitatively different forms of behavior, with a discontinuous transition between these two behaviors coming about when a given change in value results in a critically unstable region being crossed.

Although catastrophe theory goes on to catalogue a diverse range of other catastrophe surfaces (such as the *fold*, the *butterfly*, the *swallow-tail* and the *elliptic umbilic* catastrophes), the fact that these other forms of morphogenesis play no role in the present exposition means that any further discussion of them will be foregone. Instead, the following section will proceed by developing a model of the lyric that shows it to be congruent with the cusp catastrophe. In this way, a movement will be made from the general discussion of catastrophe theory that characterizes the present section to the local application of the methods of catastrophist modeling that is conducted in the section following. Necessarily, both sections will set the scene for the final section, which will engage in an empirical analysis of “The Lake Isle of Innisfree.”

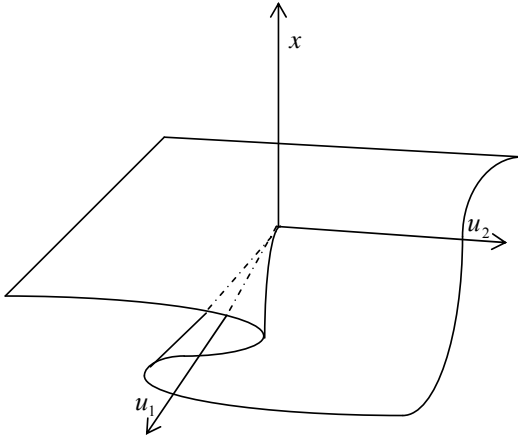


Figure 3. *Catastrophe surface for the cusp catastrophe*

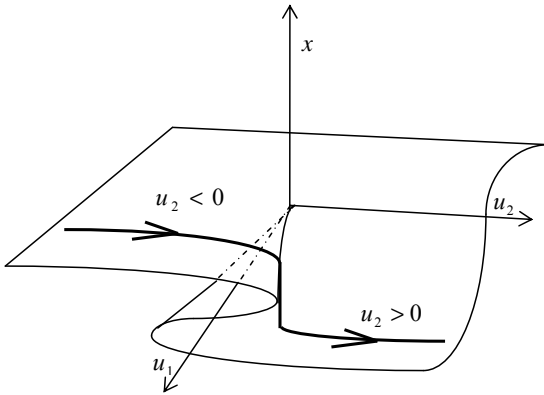


Figure 4. *Discontinuous change in the function  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$*

## 2. The catastrophist model of the lyric

When coordinating the semantic structure of the lyric with the formalism of catastrophe theory, the most significant preliminary issue that needs to be addressed is the question of what semantic level the projected model of lyrical expression should take as its point of departure. As a signifying structure that simultaneously operates on the lexical, sentential and discursive levels, the lyric offers a plurality of possibilities for semantic analysis, with the conse-

quence that any projected analysis of the lyric needs to be clear from the outset as to which of these levels it seeks to address. In this connection, it is worth stating here that the present section will primarily engage with the lyric at the level of discourse. Though it can be legitimately argued that this approach ignores the important question of how the lexical and sentential elements that comprise the lyric are transformed into macro-structural unities, it is nevertheless felt that this issue is adequately dealt with in the vast critical literature that has emerged in the field of discourse analysis over the last thirty or so years. (See Longacre [1996], van Dijk [1977] and van Dijk and Kintsch [1983] for representative examples of this literature.) Bypassing the lexical and sentential levels, I will suggest here that the reception of the lyric by an auditor or reader is concomitant with a series of generalizations, deletions and abstractions that have as their end result the identification of three macro-structural unities – namely, the *psychological* unity of the speaker's consciousness, the *material* unity of an indifferent or hostile environment and the *tropic* unity of a desired object. ('Tropic' is here to be interpreted in the biological sense as an object or force that exercises an attraction on an organism.) On the basis of this provisional taxonomy of the discursive articulations of the lyric, my model will thus take as its target data the three identified macro-structural unities that purportedly characterize lyrical discourse.

With this preliminary question of semantic level resolved, it is now possible to begin constructing the catastrophist model of lyrical semantics. What this means in practice is showing that the function that encodes the cusp catastrophe,  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$ , can be used to characterize the semantic structure of the lyric. In this connection, the first need is to identify a dependent variable  $x$  and two independent parameters  $u_1$  and  $u_2$  that affect the behavior of  $x$ . It is here, as might be imagined, that the previous identification of the three macro-structural unities in the lyric becomes relevant. Specifically, it is clear that the initial unity identified – the psychological unity of the speaker's consciousness – can be equated with the dependent variable  $x$ . Correspondingly, as parameters that affect the behavior of the speaker's consciousness,  $u_1$  and  $u_2$  can be equated respectively with the material unity of the hostile environment and the tropic unity of the desired object. This gives the following correspondences as the primitive terms of the catastrophist model:

- $x$  = the psychological unity of the speaker's consciousness
- $u_1$  = the material unity of the hostile environment
- $u_2$  = the tropic unity of the desired object

However, while the identification of the components of the catastrophist model in this way is obviously of vital importance, it does raise an apparent problem that needs to be resolved before moving on to describing the dynamical

interaction of these components. Specifically, it is well-recognized precept of catastrophist modeling that if a model is to be genuinely effective, it must characterize the specific way in which the elements of that model depend on each other for their mutual definition – that is, it must be *structural* as opposed to *mechanical* in its orientation. In the present context, this necessity can be seen in the fact that while the mechanical enumeration of the formal components of the lyric may have a taxonomical value, it is incapable of reflecting the fact that the lyric is not encountered as a collection of discrete elements, but instead as an organic structure in which these elements mutually presuppose one another. The difference between structural and mechanical description in characterizing this latter type of relationship is made clear by Petitot when he claims that

The paradigmatic organization of semiotic systems involves a taxonomic dimension. But in its structuralist reworking the concept of taxonomy undergoes a mutation. Traditionally, taxonomy is concerned with the classification of already defined, individuated and autonomous objects. In structuralism, on the contrary, the abstract units are defined and determined by the classification itself. [...] The paradigmatic [i.e. structural] dimension is then the new appellation for the taxonomic one when we no longer assume that a multiplicity of discrete units already individualized are distributed in an abstract system of equivalence classes, but on the contrary, that a categorizing classification discretizes a substance and defines discrete units by reciprocal determination. (Petitot 2004: 55–56)

In effect, what Petitot suggests here is that for any semiotic or semantic model that is informed by catastrophist principles to be effective, then it must show how discrete forms emerge from the overall dynamics of the model, rather than impose these forms by *a priori* definition. It is here that the problem emerges. By positing the three macro-structural unities in advance of their derivation, it may seem as if the projected model of lyrical semantics is involving itself in a circular argument, in which the very structures that are the object of derivation are assumed in advance. The only response that can be made here to this is that the apparent circularity is an inevitable by-product of the order of exposition. One could, if one wished, construct the semantic model of the lyric on purely abstract grounds and then derive the typical constellations of content in the lyric from this model, but this would be merely taking rigour to the point of pedantry. As the clearly stated purpose of the present article is to give a semantic analysis of the lyric, it is felt that any methodological infractions incurred by gesturing towards the results of the analysis in advance of their derivation are more than outweighed by the greater clarity of exposition gained thereby.

This discussion of structure leads naturally to the most important issue in constructing a catastrophist analysis of the lyric, which comes with charting the mutual relationships of the three macro-structural unities represented by  $x$ ,  $u_1$  and  $u_2$ . This expedient, it will be remembered, involves showing that the semantic organization of the lyric reflects the dynamics of the function

$F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$ . In particular, there is a need to show that the three relevant variables nominate some scalar quantity that is distributed between the three macro-structural unities that comprise the lyric in accordance with the determinations of the function governing the cusp catastrophe. In the present connection, this scalar quantity will be identified with *energy*, or perhaps more evocatively, *potency*. Each of the three macro-structural unities can, to a greater or lesser extent, affect the behavior of the others in accordance with the value that it takes in the overall scheme of the lyric. The desired object, for example, can exercise different degrees of attraction on the speaker's consciousness, just as the hostile environment may overwhelm (or be overwhelmed by) the tropic force of the desired object. Thus, what the function  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  will be taken as determining is how  $x$ , the speaker's internal reservoir of mental energy, is affected by variations in the energetic status of the external parameters  $u_1$  and  $u_2$  – namely, the hostile environment and the desired object respectively. However, because these variables are represented as interacting in very mathematically specific ways, the assertion that  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  represents the energetic dynamics of the lyric needs to be justified. This will be achieved by going through each variable in turn and showing how its manifestation in the lyric is modeled by  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$ .

To start with the dependent variable,  $x$ , the need is to show how the operations of the speaker's consciousness can be viably characterized by the term  $x^4$ . As might be expected, this involves dwelling on the reflexive nature of the consciousness depicted in the lyric. Though the lyrical consciousness is invariably a directed consciousness, this directedness can nevertheless be thought of, in Northrop Frye's words, as "the poet presenting the image in relation to himself" (Frye 1968: 249). That is to say, despite the influence of external factors (which will in any case be dealt with later), the thematic concerns of the lyric are invariably fixed in relation to a positing subject, and it is the auto-productive activities of this subject that thus define the ground of the lyrical act. Consequently, the problem becomes that of coordinating the self-reflexive nature of the speaker's consciousness with the value  $x^4$ . In this scenario, the most profitable line of approach is to correlate the psychological and the mathematical notions of reflexivity. While there is obviously a significant difference between the two in epistemological terms, what they both involve is the acting of any entity on itself in terms of a given relation. In mathematics, for example, reflexivity can be defined as any binary operation  $x * x$ , where  $*$  represents the binary operation; while in psychological terms, reflexivity involves the subject's second-order thematization of its own thoughts. On this basis, I will suggest here that the energetic activation of the speaker's consciousness in the lyric can be identified with the amplification of a basic energy level  $x$  to the value  $x^4$  brought about by the action of reflexive contemplation. Though this

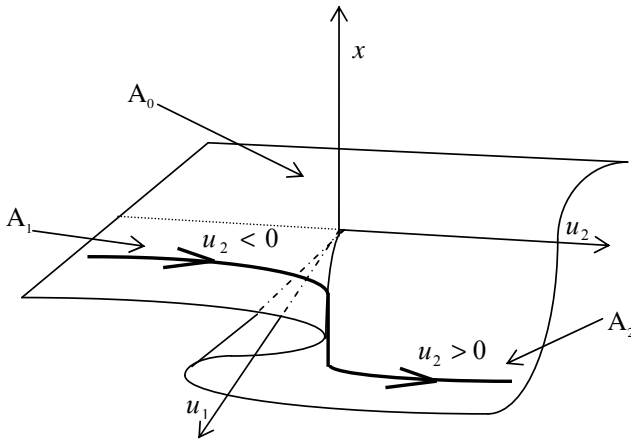
may seem to run the risk of conflating dissimilars, it nevertheless succeeds in effectively coordinating the qualitative fact of the subject's mental animation with a relative (rather than numerical) measure of that activation. Moreover, the identification of the product  $x^4$  with the energetic state of the self-reflexive subject also succeeds in preserving the qualitative identity of the subject with itself if the product  $x^4$  is conceived of as a Boolean predication. As Boole suggests, the identity  $x^2 = x$  "is, in fact, the expression of the second general law of those symbols by which names, qualities, or descriptions, are symbolically represented" (Boole 1958: 31); and thus there is a clear precedent for substituting  $x$  for each  $x^2$  factor in  $x^2x^2 = x^4$ , thereby yielding the identity  $x^2 = x^4$ , which of course finally breaks down to  $x = x^4$ . Putting all of this together, what emerges is that there is a reasonably compelling argument for identifying the energetic activation of the speaker's consciousness with the value  $x^4$ . While it is only fair to concede that this argument can be used to justify the identification of the speaker's consciousness with any value of the form  $x^{2^n}$ , this will not affect the topological structure of the derived catastrophe surface, and thus the general dynamics of the semantic model of the lyric remain unchanged.

This leads naturally to the question of how the hostile environment or  $u_1$  can be integrated into the model. In practical terms, this involves accounting for the term  $-u_1x^2$  in the function  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$ . From the outset, it is clear that the negative value of this term can be coordinated with the fact that the indifferent or hostile environment has a dampening effect on the speaker's mental energy. That is to say, it places a barrier between the speaker and the desired object. However, because the status of the environment as indifferent or hostile is itself a function of speaker's consciousness, it is clear that its basic energy level needs to be correlated with that of the speaker. Correspondingly, the product of  $u_1$  and  $x^2$  in  $-u_1x^2$  can be naturalized as the synthetic expression of the speaker's intentional relation with the hostile environment. Again, the value  $x^2$  here preserves the speaking subject's qualitative identity with itself in accordance with the Boolean identity  $x^2 = x$ , but its lesser value in terms of relative quantity indicates that the speaker's engagement with the environment is, in energetic terms, subordinate to the act of self-reflexive contemplation. Thus, with the naturalization of the term  $-u_1x^2$ , the first two macro-structural unities of the lyric become incorporated into the semantic model.

This then leaves as the final task the correlation of the tropic unity of the desired object with the last term of  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  – namely,  $u_2x$ . As with the material unity of the environment, this is a compound term, in that the attractive value of the desired object is at least partially a function of the speaker's consciousness. Where it differs from the material unity of the environment, however, is in the fact that the tropic unity of the desired object *augments* the energy level of the speaker's consciousness. In the contemplation of the desired object, the speaker gains either consolation or resolution,

and thus the interaction of the speaker's consciousness and the desired object contributes to the reservoir of mental energy at the speaker's disposal. Nevertheless, because the desired object is always encountered remotely, it lacks the immediate force of the indifferent or hostile environment, and for this reason, the consciousness of the speaker is exercised more by its environment. Consequently, for equal values of  $x$ ,  $u_1$  and  $u_2$ , the value of  $u_2x$  will be less than the absolute value of  $-u_1x^2$ , though this can obviously change for sufficiently large values of  $u_2$ .

On a more general level, what emerges is from all this is that the interaction of three macro-structural unities of the lyric can, on a very provisional level, be identified with the dynamics of the function  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$ . The importance of this, of course, is that the relative variations of these unities in relation to one another can be represented by the catastrophe surface  $\frac{dF}{dx} = 4x^3 - 2u_1x + u_2 = 0$ . In this scenario, it is evident that for positive values of  $u_1$ , there are two stable states for  $x$  – namely, the upper and lower sheets of the catastrophe surface. Specifically, it emerges that for some constant positive value of  $u_1$ , the hostile environment,  $x$  retains a constant value as  $u_2$ , the tropic force of the desired object increases; with  $x$  suddenly jumping from one stable state to another when  $u_2$  reaches a certain critical value (see Figure 5).



- A<sub>0</sub>: Synthetic unity of speaker with desired object
- A<sub>1</sub>: Stable region of contemplation
- A<sub>2</sub>: Stable region of action

Figure 5. *The semantic partition of the lyric*

Thus, on the semantic plane, what the whole system charts is how the potential mental energy engendered by the speaker's contemplation of the desired object is discontinuously transformed into the kinetic energy of action when the negative energy of the hostile environment is overcome. In this sense, the drop in the value of  $x$  when the critical threshold is crossed corresponds to the investment of mental energy in action, and thus to an actualization of a virtually projected state. From a broader perspective, the model also identifies the lyric as encoding what is known as a *metastable* state, which is a state of local equilibrium in which the crossing of a small energetic threshold will bring about a global change in the behavior of the system.

While it may seem that the theoretical infrastructure is now in place for a discussion of how the lyric's mediation between action and contemplation relates it to the issue of actional competence in narrative, this discussion will be foregone for the time being in favor of a practical application of the model. This will be achieved in the next section by applying the catastrophist model of lyrical semantics to W.B. Yeats' "The Lake Isle of Innisfree." While I readily recognize that no one application of the model can give it sufficient empirical verification, my hope is that a concrete instance of the model in action will go some distance towards demonstrating its utility.

### 3. The application of the model

In any application of the catastrophist model of lyrical semantics to an actual example of lyric poetry, it follows that the most useful results are likely to be obtained by selecting a poem that is generally recognized as an exemplar of the lyric genre. It is for this reason that Yeats' "The Lake Isle of Innisfree" is selected here. As C. Stuart Hunter suggests, "the poem is a simple nostalgic lyric expressing the speaker's desire to find a kind of peace in a place of rural solitude he has known in his youth. Apart from some minor metrical effects, there is nothing in the form and structure of the poem to indicate a departure from tradition in the work" (Hunter 1984: 72). To the extent that Hunter is here correct in identifying "The Lake Isle of Innisfree" as reproducing the traditional concerns of lyric poetry, it follows that it can be analyzed using the catastrophist model without introducing any provisos concerning the poem's deviation from the generally recognized boundaries of the lyric form. This is not, of course, intended as a normative stipulation concerning what should and should not count as a lyric – instead, the aim is to secure the viability of the model by applying it to a typical lyric, rather than some variant on the genre.

In terms of concrete detail, the text of the poem that will be used here is that from Yeats' 1895 volume, *Poems*. For the sake of convenience, this ver-

sion is reproduced in its entirety below, though most readers will doubtless be familiar with it already.

### The Lake Isle of Innisfree

I will arise and go now, and go to Innisfree,  
And a small cabin build there, of clay and wattles made:  
Nine bean-rows will I have there, a hive for the honey bee,  
And live alone in the bee-loud glade.

And I shall have some peace there, for peace comes dropping slow, 5  
Dropping from the veils of the morning where the cricket sings;  
There midnight's all a glimmer, and noon a purple glow,  
And evening full of the linnet's wings.

I will arise and go now, for always night and day  
I hear lake water lapping with low sounds by the shore; 10  
While I stand on the roadway, or on the pavements grey,  
I hear it in the deep heart's core.

As a poem that, to use Jonathan Culler's formulation, charts "an oppressive inability to experience, which paradoxically enables an experience of self-dramatization" (Culler 2001: xii), it is clear that "The Lake Isle" delineates the three macro-structural unities of the speaker's consciousness, the hostile environment and the desired object that have been identified in the previous section as central to the lyric. This can be seen by evaluating each category in turn.

In the first instance, it is evident that the poetic voice, by enjoining a series of idealized future actions, identifies itself as the expression of a singular consciousness in communication with itself. As such, the entire meditation on Innisfree has the nature of fantasy – a supposition that is supported by Yeats himself when he describes the genesis of "The Lake Isle" in an 1888 letter to Katherine Tynan: "In my story I make one of the charecters [sic] when ever he is in trouble to long to go and live on that island – an old daydream of my own. Thinking over his feelings I made these verses about them" (Yeats 1986–1994: 120). The character in question here is John Sherman, the eponymous hero of Yeats' second work of fiction, who, like the Innisfree poet, seeks to escape to the similarly romanticized island of Inniscrewin. As Yeats suggests, the underlying motivation for both literary efforts is an old daydream of his own, and thus the consciousness of "The Lake Isle" is clearly engaged in an act of reflexive self-contemplation. This external evidence for the presence of a singular consciousness in the poem is further corroborated in the poem itself by references to hermitage and isolation. In particular, when the poet projects the "Nine bean-rows" (3), the "hive for the honey bee" (3) and his desire to "live alone in the bee-loud glade" (4), he invokes the example of Henry Thoreau, who similarly retreated to a childhood landscape in search of wisdom. As Hunter observes:

To connect the retreat to Innisfree with Thoreau's retreat to Walden in search of wisdom, Yeats carefully includes not only the honeybee, traditionally a symbol of industry, culture, and wisdom, but also the bean plant. Through this latter image, one sees a connection between Yeats' retreat and Thoreau's that places the former's retreat in into a particular symbolic context. (Hunter 1984: 73)

This intertextual emphasis on the retreat from society into a world of isolated contemplation is augmented further in the second stanza, where the temporal references to the "veils of morning" (6), the "midnight's all a glimmer," (7), and the "noon a purple glow" (7), when combined with the zoological references to the cricket (6) and the linnet (8), all serve to place the poet in the natural as opposed to social world. Thus, from the most general perspective, it is clear that "The Lake Isle" signals the activation of a singular consciousness at the rhetorical, thematic and biographical levels.

Moving on to the category of the hostile environment, there is clear evidence both in the poem and in the circumstances of its composition that it was written in direct response to the alienating atmosphere of urban London. From an autobiographical perspective, Yeats recounts the inspiration behind "The Lake Isle" in the following words:

I still had the ambition, formed in Sligo in my teens, of living in imitation of Thoreau on Innisfree, a little island in Lough Gill, and when walking through Fleet Street one day very homesick I heard a little tinkle of water and saw a fountain in a shop window which balanced a little ball upon its jet, and began to remember lake water. From the sudden remembrance came my poem *Innisfree*, my first lyric with anything in its rhythm of my own music. (Yeats 1961: 153)

Clearly, the key term here is "homesick." By directly relating the motivation behind "The Lake Isle" to his homesickness, Yeats succeeds in expressing the dampening effect of the urban environment on his spiritual sensibilities. In the text of the poem, this disaffection with urban life manifests itself most succinctly in the line "While I stand on the roadway, or on the pavements grey" (11), where there is a jarring contrast between the bucolic reverie of the first two stanzas and the emotionally flat description of the urban metropolis. Indeed, it is precisely in this contrast that the dampening effect of the hostile environment is most evident. Though there is only one explicit reference to the urban environment in the poem (the line immediately quoted above), the intensity with which Innisfree is evoked testifies to the strength of the hold that the poet's external circumstances have on him. In this sense, the indifferent or hostile environment is present throughout the poem as a thematic counterpoint to the romantic otherworld of Innisfree, even if this counterpoint is only directly evoked once.

This, finally, brings us to the issue of the desired object. In some regards, this is both the easiest and most difficult semantic constellation to identify in

"The Lake Isle." On the one hand, it is easy, because the poet's yearning for the island and its associated lifestyle clearly identifies it as the desired object; whereas on the other, it is difficult because of the sheer range of associations at work in the poem make it impossible to nominate what, exactly, Innisfree symbolizes for Yeats. Rather than work through the many different interpretations available, I will adopt here the perspective of James Allen when he argues that Yeats' poetry deals with "the archetypal, mythic, or ritual journey, emblematic of man's course through life towards some ideal or transcendent goal" (Allen 1974: 93). As this reading of Yeats is sufficiently broad to cover most extant interpretations of "The Lake Isle," it will serve here to characterize the general character of the desired object without engaging in polemics as to its precise nature. Considered from this perspective, what emerges is that the desired object in "The Lake Isle" is less a physical location than a mental state that allows the poet to transcend the material concerns of everyday life. In this connection, "The Lake Isle" initiates one of the central tropes of Yeats' poetry as a whole: the notion of a journey over water towards some spiritually significant destination. As Allen puts it: "One of the most predominant journey patterns in Yeats' works is that across water. A favourite motif is a trip to a paradise-like isle or shore whose scene and setting borrow heavily from the Eden imagery of Christian myth" (Allen 1974: 94). Viewed from this angle, what Innisfree correspondingly signifies is the poet's own inner compulsion to return to an imagined prelapsarian state that is at once evocative of both his own childhood and a projected state of future spiritual development. Consequently, the attractive force exercised by Innisfree can, on the most general level, be identified as its imaginative externalization of a desired state of mind that the poet wishes to enter into.

Putting the different components of this analysis together, what emerges is that the three macro-structural unities of the speaker's consciousness, the hostile environment and the desired object can all be identified in "The Lake Isle of Innisfree." It is, however, when these unities are inserted into the catastrophe model that the dynamics of their interaction most clearly emerge. Specifically, it becomes evident that the catastrophe surface associated with the function  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  clearly charts the discontinuous jump from contemplation to action that animates "The Lake Isle." When the poet twice asserts "I will arise and go now" (1, 9), what he is effectively doing is marking the point at which the energetic force of the desired object – the mental state associated with Innisfree – overcomes the negative potential of the hostile environment. For obvious reasons, this competition between local energy regimes cannot be quantified, but on the qualitative level, the poem is 'situated' on the set of unstable points where  $u_2$ , the tropic force of the desired object, is approaching zero. Thus, what the lyric records is the transformation of *thought* into *action*. By meditating upon the desired object, the poet aug-

ments his internal reservoir of mental energy and in doing so, he succeeds in overcoming the inhibitory effect of his external circumstances. Moreover, the catastrophist model, by associating this transition with the cusp catastrophe, makes it possible to see the lyric as the linguistic reflection of a basic morphology that underwrites a plurality of dynamic processes in the natural and cultural worlds. As Golubitsky observes:

[The] models [of catastrophe theory] give pictures which may well appear in different situations. To the extent that these models give a realistic picture of certain standard arguments they should be incorporated into our language as linguistic models. The list of – seemingly a thousand and one – different uses of the cusp catastrophe is just one example of this process in action. (Golubitsky 1978: 384)

If, as suggested here, the dynamical structure of the lyric can be seen as one of the “thousand and one” examples of the cusp catastrophe in operation, it consequently follows that the semantics of lyrical expression can be ‘naturalized’ as the reproduction of an elementary form of morphogenesis. In this scenario, the lyric is not congruent with the world of the subject because it articulates salient items of thematic content, but instead, because it organizes this content in a way that activates the innate psycho-perceptual schemes that have evolved over the course of human and pre-human history to model change in the external environment. The net result of this is an interpretation of the lyric that, by relating it to the objective morphology of discontinuous changes, sees it less as an autonomous cultural product than as the expression of a more general, biologically conditioned schema that legislates for the human negotiation of the external environments.

#### 4. Conclusion

With the catastrophist model of lyrical semantics now delivered, it is possible to return, by way of conclusion, to the question raised in the introduction of how lyrical and narrative semantics relate to one another. In this connection, it will be remembered that my central supposition was that the lyric can be understood as an embryonic articulation of the actional stance underwriting more complicated forms of narrative expression. At the most general level, critics like John Boyd and Anne Williams argue for a link of this kind between narrative and the lyric when they suggest that “the voice that we experience when we read a lyric poem [...] is a fictional entity very much akin to the ‘narrator’ of narrative prose” (Boyd and Williams 1983: 581), but their failure to make anything more of this claim means their work does not go far enough when it comes to establishing the postulated relations between lyric and narrative. For this, what is needed is a more detailed assessment of how the actional

stances underwriting narrative and lyrical modes of expression both differ from and resemble one another.

In this regard, the most succinct account of actional competence in narrative is probably given by Greimas when he explores the notion of *actantial doing* in narrative sequences. In Greimas' formulation: "According to *motivating logic* (*post hoc, ergo propter hoc*), the subject must first acquire a certain competence before it can become a performer. According to the *logic of presuppositions*, the performing doing of the subject implies an existing competence for that doing" (Greimas 1987a: 110). On the basis of what Greimas suggests here, it is clear that competence is one of the central modalizations of narrative, in that it is the failed or successful transformation of competence into performance that identifies narrative actors as being efficacious or not. As will be immediately recognized, this resonates with the model of the lyric I offer here, which interprets the energetic activation of the speaker's consciousness by the desired object as an attempt to overcome the inhibitory effect of the hostile environment. Moreover, just as the failure to competently act in narrative produces iterative sequences of similar actions (such as the repetition of the test in the folktale), failure on the part of the speaking subject in the lyric to overcome the hostile environment leads to the notion of a lyrical cycle, in which the speaker makes repeated attempts to apprehend the desired object. (For a mathematically informed discussion of this, see Rinaldi's (1998) discussion of Petrarch's love poetry.) In both cases, the recurrence of issues relating to competence, success, failure and repetition goes a considerable distance towards identifying a common organization of semantic content in narrative and the lyric.

However, it is important too to remain conscious of the differences between lyrical and narrative expression. While both genres certainly deal with questions of agency and competence, narrative introduces a level of polemical engagement that is absent in the lyric. In particular, even the most elementary narratives are predicated on the notion of conflictual narrative programs, in which a subject and an anti-subject contest with one another in pursuit of some object of value. Greimas, again, perhaps expresses this best when he notes that in "most primitive forms of story [...] we have two subjects who are simultaneously present and share the same desire for one and the same object. Such a situation can be considered typical of elementary narrativity" (Greimas 1987b: 94). As needs little explication, this account of narrative contrasts strongly with that of the lyric, where, unlike narrative, there is only one actional trajectory – that of the speaker towards or away from the desired object. Against this, narrative succeeds by superimposing actional trajectories upon one another in way that generates a multidimensional, thematically qualified space that can be used to discretely partition the actual world into meaningful categories. (For a fuller account of this interpretation of narrative, see Carney [2007].)

Expressed in the formalism of the model of the lyric delivered above, what this means is that in narrative,  $u_1$ , the value assigned to the hostile environment in the function  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$ , does not remain static, but expresses the value taken by another function of the form  $F(x, u_1, u_2) = x^4 - u_1x^2 + u_2x$  that charts the relation of the polemical anti-subject to the desired object. As this situation also obtains in reverse, what emerges from this is that narrative can be seen as a complex structure built up from the reciprocal determinations of two or more basic programs that link a desiring subject, an indifferent or hostile environment and an object of attraction. In this sense, the semantic structure of the lyric can thus be seen as an 'atomic' constituent of the 'molecular' organization of narrative.

Putting all of this together, what consequently emerges is an understanding of the lyric that sees it as a limit-case of narrative expression. As an articulation of the simplest way in which a subject and a desired object can be placed into a dynamic relation of non-identity, the lyric is the simplest possible form of narrative, and is correspondingly present in every narrative in the shape of its constituent narrative programs. Considered from this perspective, the semantic organization of the lyric is the means by which thematic difference is correlated with the structures of desire and agency. On the one hand, by marking the discontinuity engendered in the human perception of the world by frustrated desire, the lyric makes possible the topological coordination of actantial programs carried out by narrative; while on the other, by overcoding these discontinuities with thematic qualifiers, the lyric succeeds in providing narrative with semantic data from which an axiological universe can be constructed. It is in this sense that the lyric can be considered as an embryonic form of narrative. Though the lyric obviously lacks the structural complexity of narrative, the mode of thinking that informs it generates raw material for the narrative consciousness to utilize. Thus, from a catastrophist perspective at least, there is a clear case to be made for an understanding of the lyric that is sensitive to the shared system of organization that allows both lyrical and narrative modes of expression to map onto the world. To this extent that this assessment is correct, I am correspondingly hopeful that the present article has at least gestured towards a viable semantic model of lyric poetry.

*University of Limerick*

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