

Chaos, Fractal & Elusive Formula for the Future: A Reading of Tom Stoppard's *Arcadia*

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Abstract

Tom Stoppard announced his arrival on the British theatre with his breakthrough play *Rosencrantz and Guildenstern are Dead* in 1966. Since he appeared towards the fag-end of the theatre of the absurd era, he did at once imbibe and depart from the core tenets of the absurd worldview. One interesting point that early Stoppardian plays often explore is the question of free will versus determinism. This question becomes further intriguing in mature Stoppard. While free will is often disallowed a free run, the path of inevitable predictability becomes more of a question mark. Stoppard largely resolves this perennial conflict in his unique way in his 1993 play *Arcadia*. This resolution is aided by otherwise non-theatrical ideas – ideas which primarily pertain to the world of science and geometry. This article would decipher the layers of Chaos theory, fractals, Fermat's Last Theorem, iterated algorithm et al, and zero in on how these scientific concepts are integrated by Stoppard into not only the content, but also the form of the play.

Keywords: free will, determinism, chaos theory, fractal.

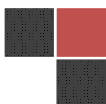
Introduction

It is a fascinating paradox that Tom Stoppard, who never completed his college-education and who relentlessly satirizes academicians in his plays, integrates intellectual and academic ideas in many of his plays. From a simple incident of coin-toss to a grand adventure to the moon – anything may set his dramatic ideas rolling. However, prior to his 1993 play *Arcadia*, Stoppard never employed complex ideas from the world of science to explore largely philosophical queries. But with *Arcadia*, he embarks upon this daring attempt to address age-old questions of order, chaos and time through various scientific prisms including chaos theory, thermodynamics, fractals, algorithms etc. Nigel Hawkes rightly comments in "Plotting the Course of a Playwright" that *Arcadia* "celebrates scientific ideas in a way which is unusual, if not unique, in British theatre" (266).

Ira Nadel, Stoppard's biographer, informs us that the "principal source of Stoppard's understanding of chaos theory was James Gleick's *Chaos*" (Nadel 431). The full title of Gleick's book is of course 'Chaos: The Making of a New Science'. However, Stoppard's concern with order and chaos is nothing new. In Stoppard's 1966 novel *Lord Malquist and Mr. Moon*, Mr. Moon had wondered: "If it is all random, what's the point?" to which Malquist had given an interesting reply: "What's the point if it's all inevitable" (129). The assertion, almost a Wildean one, is that predictability takes the fun away while chaos has a charm of its own. Gleick's chaos theory finally offered Stoppard, as he himself suggested, "a reconciliation between the idea of things not being random on the one hand and yet unpredictable on the other hand" (qtd. in Fleming 191). John Fleming points out: "Perhaps what appealed to Stoppard is that chaos theory attempts to systemize that which appears to function outside of any system. It describes a world in which there is chaos in order, but also order in chaos." (Fleming 191)

Stoppard's choice of the play's title is thoughtful. By giving his play the title *Arcadia*, Stoppard evidently wants to invest his play with an aura that goes back to distant past. Hanna Scolnicov writes in "'Before" and "After" in Stoppard's *Arcadia*": "The title positions this very modern drama within an almost infinite line of backward-looking, neoclassical regressions, hearkening back all the way to classical antiquity" (492). Stoppard particularly reminds the audience of the 17th century painter Nicolas Poussin's pastoral painting "Et in Arcadia ego". This serves dual purposes. On one hand, the phrase "et in Arcadia ego" brings in the idea of death. Stoppard makes it abundantly clear at the beginning that the play is not about any idyllic perfectibility. Rather, it is a world where both death and eros lurk beneath a picturesque landscape. On the other hand, landscape gardening operates as an integral motif in this play. The change in Sidley Park is not a mere change in facade; the changing landscape is symbolic of the upheavals that marked the transition from the Enlightenment predilection for decorum, symmetry, order to a Romantic ethos of liberty, spontaneity and occasional wilderness. To Stoppard, "the difference between Romantic and Classical attitudes and eras" (Nadel 428) becomes a starting point for *Arcadia*.

It is in this context that passion, eros and poetry flourish in the garden of Sidley Park in a transitional year of 1809. The opening of the play is as startling as the opening of metaphysical poems. In the very opening dialogue of the play, Thomasina asks his tutor Septimus: "Septimus, what is carnal embrace?" (p. 1). This question paves the path for a curious unfolding of events where Septimus finds himself at the receiving end of an accusation for getting involved in carnal embrace with Mrs Chater. Faced with this

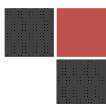


question from his precocious pupil, Septimus finds himself in a double bind. Explaining the concept of 'carnal embrace' would be inappropriate for him as a tutor, while addressing the query of his pupil is his responsibility. An exasperated Septimus eventually explains the idea of 'carnal embrace', but pits it against the mathematical theory of Fermat's Last Theorem which says that the sum of two cubes is not a cube. These contrasting ideas of union and difference run throughout the play. While Septimus tries to get away from his discomfort with this juxtaposition of passion and algebra, as for Thomasina, her queries ring more profound enquiries.

The play is set in two time-frames: 1809 and present day (1993). Stoppard contrasts the lively inquiries of the thirteen-year girl Thomasina with the inquiries of the present day researcher Bernard Nightingale who is more bent on discovery, but less gifted in enquiry. It is a Stoppardian paradox that a play which relies on countless scientific and academic ideas also exposes the fatuity of many a research which is undertaken by the researcher with an eye on fame and recognition. However, one character who, uncharacteristic of her age, keeps on asking simple questions – questions which may seemingly be absurd, but have far-reaching potential – is Thomasina. For instance, of particular importance is her observation: "When you stir your rice pudding, Septimus, the spoonful of jam spreads itself round ... But if you stir backwards, the jam will not come together again" (4). This uni-directionality of phenomena is striking given the engagement with time and memory in multiple Stoppardian plays. Past becomes irretrievable. David Nathan opines in his article "In a Country Garden (If It Is a Garden)": "... *Arcadia* alternates between two radically different time periods and raises questions about how the past impinges on the present and how the present can understand (and misunderstand) the past" (261). A moment, once past, is irrevocably past. It is no wonder that the literary researcher Bernard treads a wrong path and arrives at a ridiculous conclusion.

Septimus, however, is assured in his disposition: "time must needs run backward, and since it will not, we must stir our way onward mixing as we go, disorder out of disorder into disorder" (4). The last part of the statement is note-worthy. It is not a case of order and disorder at odds with each other. It is a matter of one set of disorder, impacted by another set of disorder, leading to yet another set of disorder. Disorder seems to be the way of the universe, and this is where Newtonian conception of universe went wrong. Thomasina lays out the Newtonian conception, which is now held suspect by her, when she underlines the impossibility of Newtonian hypothesis: "If you could stop every atom in its position and direction, and if your mind could comprehend all the actions thus suspended, then if you were really, *really* good at algebra you could write the formula for all the future" (5). This sort of predictability being subverted, the age-old concept of determinism does not hold enough ground. Nigel Hawkes observes in "Plotting the Course of a Playwright": "Chaos theory ... represents the overthrow of determinism, the idea that nature behaves like a giant piece of clockwork whose functioning, once understood, can be perfectly predicted in advance" (266). Prapassaree Kramer and Jeffrey Kramer elaborate in their article "Stoppard's *Arcadia*: Research, Time, Loss": "Relativity eliminated the Newtonian illusion of absolute space and time; quantum theory eliminated the Newtonian dream of a controllable measurement process; and chaos eliminates the Laplacian fantasy of deterministic predictability" (4).

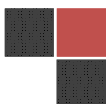
The repeated reference to apples in Scene 2 and Scene 3 of *Arcadia* not only evokes the concept of knowledge, but also the notion of sin. It also becomes symbolic of



the apple of discord – a discord between a notion of a stable universe in its equilibrium with a universe tottering unsteadily, driven by frenzied logic of chaos and elasticity. While God has traditionally been perceived as a creator behind a grand design, Stoppard's 1993 play conceives of God more as a programmer who has curved dots and numbers into patterns that constitute this universe. Thomasina on her part tries to figure out the equation of an ordinary leaf. Her position is echoed by modern-day Valentine who observes: "Relativity and quantum ... they only explained the very big and thee very small. The universe, the elementary particles. The ordinary-sized stuff ... clouds – daffodils – waterfalls -- and what happens in a cup of coffee when the cream goes in – these things are full of mystery" (40). Valentine elaborates the point with a few more examples. For instance, he draws attention to the fact that "We're better at predicting events at the edge of the galaxy or inside the nucleus of an atom than whether it'll rain on auntie's garden party three Sundays from now" (40). As to why the last prediction is difficult can be explained by what is known as 'butterfly effect'. Fleming explains this 'butterfly effect' in the following way: "dynamic systems have a sensitive dependence on initial conditions; minor alterations in input (for example, rounding .506127 to .506) can cause major variations in outcome" (Fleming 193). Valentine elaborates the principle at work with the reference to an erratic tap: "We can't even predict the next drip from a dripping tap when it gets irregular" and therefore, Valentine comes to the conclusion that the "future is disorder" (40). However, Bernard argues that 'progress' ought not to be considered synonymous to 'perfectibility'.

A close parallel to this ruling chaos and disorder is found in the frenzy of passion that rules human heart. Captain Brice's fixed passion for Mrs. Chater, Septimus' fluctuating passion for Mrs. Chater, Gus' dance with Hannah -- all point to a flaw in determinism. Lady Croom opines that "It is a defect of God's humour that he directs our hearts everywhere but to those who have a right to them" (61). While Poussin's "*Et in Arcadia ego!*" refers to Death, in this arcadia of Thomasina and Septimus, discordant notes are provided not only by Death, but also by eros and poetry as Chloe says "Even in Arcadia -- Sex, Literature and Death at Sidley Park" (62). While the Second Law of Thermodynamics underscores that the universe is constantly losing heat, it scarcely takes into account the heat of passion as well as the coldness of death. Death also flouts the dictate of order as Mr. Chater dies of a sudden monkey-bite in the Caribbean, thereby allowing Captain Brice to fulfil his passion for Mrs. Chater. This monkey-bite also punctures Bernard's fanciful theory that Mr. Chater was killed by Lord Byron in a duel. This discomfiture of Bernard not only emphasises the wild geese-chase by academicians, but also conveys the message that working backwards is not the natural rhythm of time or universe. 'Tock-tick' moves time only in the poet's imagination.

Enoch Brater observes about Stoppard in "Playing for Time (and Playing with Time) in Tom Stoppard's *Arcadia*": "Lord Byron, steam engines, landscape architecture, carnal knowledge and hermits all became essential parts of his new Arcadian game plan. Postmodern pastiche would now frame the ongoing debate between classicism and romanticism. (157)" However, despite a few postmodernist traits, the play belongs predominantly to the modernist orientation. At first sight, one may feel that Stoppard's emphasis on chaos theory and critique of determinism invoke a Lyotardian "incredulity towards metanarratives" and thereby place the play firmly in the postmodernist terrain. However, a deeper investigation reveals definite patterns, symmetry, and congruity of form and theme. What Daniel Jernigan opines in this regard in his article "Tom Stoppard and



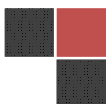
"Postmodern Science": Normalizing Radical Epistemologies in *Hapgood* and *Arcadia*" is worth-quoting in full:

One might expect a playwright as innovative as Stoppard, who has dabbled so extensively in nontraditional anti-narratives in such early works as *Rosencrantz and Guildenstern are Dead* and *The Real Inspector Hound*, to use quantum mechanics to postmodern effect, to create a work that is quantum mechanically dubious about the possibility of narrative explicability. This assumption, however, proves to be incorrect, as much of Stoppard's investigation into these theories seeks to normalize them according to a classical interpretation rather than to revel in their anti-epistemological implications. (4)

One thing that does not escape the audience's attention is that despite the shifting time-frames, the play strictly maintains the unity of place. The play never moves out of the room in Sidley Park. In its inability to go beyond the room in Sidley Park – which is demarcated by the footlights of the stage during the performance – the play refers back to its own existence as a mode of performance. Enoch Brater also finds in the play a "classical design and restraint" (163).

Another concept of science that Stoppard explores in this play is that of "fractal". The credit of coining the term "fractal" goes to Benoit Mandelbrot. In Latin, "fractal" means "irregular." However, the defining feature of a fractal is self-similarity. Clouds, mountains, snow-flakes, cauliflowers are some everyday examples of fractals. Fractal objects reveal an expanding or unfolding symmetry. Stoppard creates this 'fractal' pattern through the structure of *Arcadia*. In its alteration of scenes and dual time-frames which symmetrically separate while eventually coming together, the play celebrates a fractal shape which does not go unnoticed to an experienced member in the audience. In Fleming's opinion: "Self-similarity of dialogue, situations, characters, props, costumes, and musical accompaniment are all evident; indeed, it is the aspect of deterministic chaos that Stoppard and the production use most frequently" (Fleming 195). Lucy Melbourne identifies in *Arcadia* another similarity with painting. Melbourne writes in "Plotting the Apple of Knowledge": Tom Stoppard's *Arcadia* as Iterated Theatrical Algorithm": "The fragmented story and plot lines in *Arcadia* rearrange sequence and causality just as a Cubist painting rearranges elements of reality into a new configuration in order to highlight underlying shapes often masked by habitual modes of perception" (557). The form of the play thus reinforces the 'fractal' motif.

The play ends with a dance – waltz. On one hand, Septimus and Thomasina waltz together, marking their definite progress from the question with which the play began; and on the other hand, silent Gus holds Chloe in his arm. The dance provides a befitting resolution. The questions of order and disorder, inertia and movement, heat and passion, forward and backward rhythms – all find a resolution in the dance-form. The waltz becomes emblematic of an existence where divisions between predictability and spontaneity, between atom and algorithm melt away. It is an experience neither warranted by any theory nor predicted by sequence of determinism. The smooth dance of Thomasina and Septimus, and the awkward movements of Gus and Chloe evoke a final image of harmony and progression, though not perfectibility. R. Darren Gobert opines in "The Field of *Modern Drama*, or *Arcadia*": "The false dichotomy of "present" and "past," foregrounded so dominantly on the page, collapses" (286).



James Gleick's concept of time as "a one-way street" (257) also holds significance for Stoppard's brand of theatre where performance holds the key. In R. D. Gobert's view: "time, like performance, proceeds as it recedes, minute by minute. It exists in the present tense of its enactment at least until the final curtain" (286). Mr. Gobert asserts: "Arcadia celebrates the central feature of performance more than most plays by the matizing the second law of thermodynamics, which explains the impossibility of going backwards to a past that, we know, haunts and conditions the present" (287). Powered by science and nurtured by passion, *Arcadia* provides a comprehensive response to a time-tested question. In Fleming's view, chaos theory celebrates the "nonhierarchical reconciliation of seeming opposites" and in achieving this "combination of apparent randomness yet underlying order" (Fleming 192), chaos theory succinctly articulates the worldview of mature Stoppard. In integrating cutting-edge scientific concepts with both the plot and the form of the play, *Arcadia* becomes a Stoppardian tour-de-force. It marks a decisive step forward for Stoppard who has for once and all left behind the chaotic indeterminacy of an 'absurd' universe and found a horizon where the unpredictable becomes not merely plausible, but explicable.

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