AUDIENCE GUIDE

TOM STOPPARD'S ARCADIA

DIRECTED BY
GEOFF ELLIOTT

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ANOISEWITHIN.ORG

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Classic Theatre, Modern Magic

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Character **List**

19TH CENTURY

Lady Croom

Thomasina's mother, a commanding spitfire

Captain Brice

Lady Croom's brother

Thomasina Coverly

A young, impetuous genius; aged 13, later 16

Augustus Coverly

Thomasina's brother

Septimus Hodge

Academic, Tutor of Thomasina; aged 22, later 25

Richard Noakes

A landscape architect

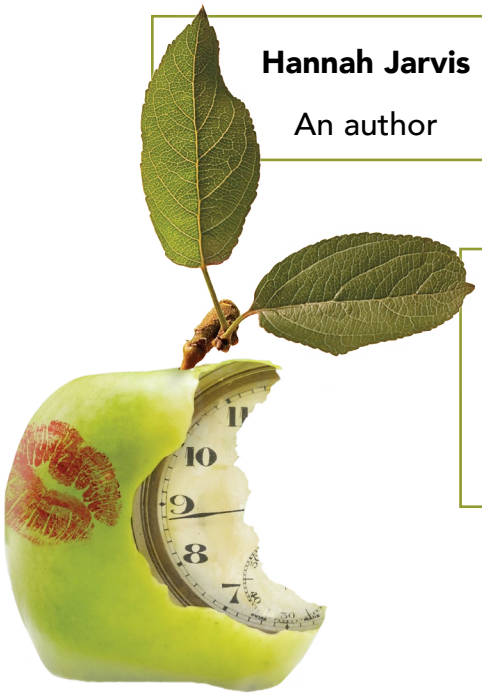
Ezra Chater

A poet and amateur biologist

Jellaby

A butler

PRESENT DAY



Hannah Jarvis

An author

Bernard Nightingale

A fame seeking fop; A charming charlatan

Chloe Coverly

Thomasina's modern day equivalent; aged 18

Valentine Coverly

Chloe's older brother

Gus Coverly

Chloe's younger brother; Augustus's modern-day equivalent, this part is usually double cast with the part of Augustus

Arcadia Characters: Notes From the Actors

Ezra Chater
played by Jeremy Rabb

What I find endearing about Chater is his ability to overlook the relentless assaults on his dignity for a taste of genuine affirmation and fame. His utter lack of talent, coupled with the brute force of his ego, is wonderfully fun to play in all its comic and tragic splendor. The exaggerated quality of his bluster reflects, at its core, an actor's similar need for self-preservation: "That critic doesn't really hate my work: he's upset about something in his life that has nothing to do with me… Many great artists through the ages have been wrongly ridiculed, so of course I'm misunderstood." I also love Chater's volatility, swinging from rage to affection to self-pity and then back again to rage all in an instant. This flipping of mood and opinion like a pancake is a trait actors share: "So-and-so didn't like the show?? Well, he's an idiot!…Oh, but you say he loved MY performance and thinks I'M talented? Well, I've always admired his taste." What makes the character so touching is that we can laugh at his absurdity, while secretly recognizing the seed of his insecurity in ourselves.

Hannah Jarvis
played by Susan Angelo

I first read *Arcadia* years ago when I was auditioning to understudy for both Hannah Jarvis and Lady Croom at the Mark Taper Forum. I spent a good deal of time preparing for what was to me an impossibly difficult play to even read, much less act. I was offered the job, but due to a work conflict, ultimately had to decline. Having only dipped a toe in, I hoped that someday I would return to *Arcadia.* Years passed, and last season, I got to read the role of Hannah in ANW's Resident Artist Reading Series. No less in awe of Tom Stoppard's mind and brilliant craftsmanship, this time I put a foot in. So, when ANW selected *Arcadia* for its 25th anniversary season, and Geoff asked me to play Hannah Jarvis, I was over the moon!! Finally, a chance to dive fully into this masterpiece!

What's incredible about this play is that to get a handle on even a short exchange of dialogue, you are sent immediately into the research mode: Classicism vs. Romanticism, Lady Caroline Lamb, Lord Byron, History of English Landscape, Capability Brown, Salvatore Rosa, Claude, Virgil, Chaos Theory, concepts of Entrophy, etc. With your head spinning, you grab hold of just enough to be able to get through the scene, but are left with the opportunity to continue learning and deepening your understanding of these subjects throughout rehearsals and performances.

It is being thrust into the research mode that has brought me into the world of Hannah Jarvis. I share her curiosity, her appetite for learning, her drive to discover and to make sense of the injustices in the world. I also identify with her comfort level that is more aligned with work than play; that trusts her brain more than her heart. *Arcadia* is a place where science is woven together with language, art and spirituality. Where the mystery of the universe is more compelling than the absolutes we try to control, and the chemistry between human beings is the most powerful energy of all.

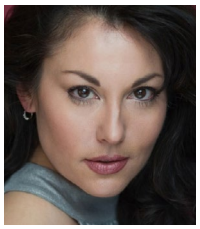
HA! Written like a "true Romantic", which Hannah Jarvis emphatically is NOT! Or…is she?

Valentine Coverly
played by Tavis Doucette

Valentine Coverly is a passionate and dedicated mathematician. He is the voice of the sciences within the present day era of the play, explaining complicated theories to the other characters and the audience. In many ways, he embodies The Enlightenment, believing that scientific progress, knowledge, and rationalism are of paramount importance. Valentine is studying population changes in grouse, a game bird similar to a pheasant, attempting to find the algorithm which would determine the population year to year. In other words, some very boring yet complicated stuff. He is in turmoil with his own mathematic endeavors, his lust for Hannah, and the discovery of Thomasina's potential genius.

As a character, I am drawn to Valentine's passion for work, and his undying thirst for knowledge. In his monologue to Hannah, we get to see Valentine explore the joy of new discovery, and with it, being proven wrong: "It makes me so happy. To be at the beginning again, knowing almost nothing... It's the best possible time to be alive, when almost everything you thought you knew is wrong." He is a dedicated man who, even in his own mathematic failures, understands his mortality and the importance of learning. Later in the play, while arguing with Bernard, we get to see Valentine express the importance of knowledge over personalities: "The questions you're asking don't matter, you see. It's like arguing who got there first with the calculus. The English say Newton, the Germans say Leibnitz. But it doesn't matter. Personalities. What matters is the calculus. Scientific progress. Knowledge." This is the thrust of Valentine's purpose in Arcadia. He is the counter argument to Bernard's robust, romantic idealism. He is the rational voice amongst literary theorists. I look forward to learning more about Valentine as I continue my journey into his mind.

Arcadia Characters: Notes From the Actors continued...



Lady Croom played by Abby Craden

I love Lady Croom she is a strong, powerful, brilliant force of a woman in a time period where women were not valued for those qualities. I feel as an actor roles are given to one to help access or in some ways work something out in your own character and to get to embody Lady Croom is truly a gift. She is helping me reconnect to my power and strength. At first I found it a bit intimadating to play someone of such wealth and esteem but she is a person just like anyone else. And I imagine she is a bit of a goddess which as an actress is fun to play with in my imagination. I love getting to portray both a mother and wife and a lover -I don't think there are many women written as she is. As an artist to get to play with Stoppards words and live in his brilliant mind is an exciting place to be.

Bernard Nightingale played by Freddy Douglas

I remember seeing this play when it first came out at the National Theatre in London. It had the feeling of an event.

The role I'm playing, Bernard Nightingale is a wonderful character. His burning ambition is to be thought of as a ground breaking historian. He has grown up, as all English people do, within a class system in which everyone knows their place. It is a silent understanding that who your parents are, where you went to school, the accent you speak with has a powerful influence on what is possible for you to achieve in life. Bernard Nightingale is trying to escape these restrictions. He is teaching in a 2nd grade University and knows that to rise to the top of the academic world he needs a great discovery.

There is a reason Bernard has seized on the subject of Lord Byron. Byron was gifted, sexually impetuous, and delighted in breaking the rules of the establishment. Byron also had a club foot and was able to overcome his disability to become one of the most celebrated figures of his time. These are the qualities that Bernard reveres.

Bernard has an internal 'club foot' of his own.

A desperate need to prove himself better than all who have looked down on him in his life.

To meet him you would never guess, but as the play unfolds we see him unravel.

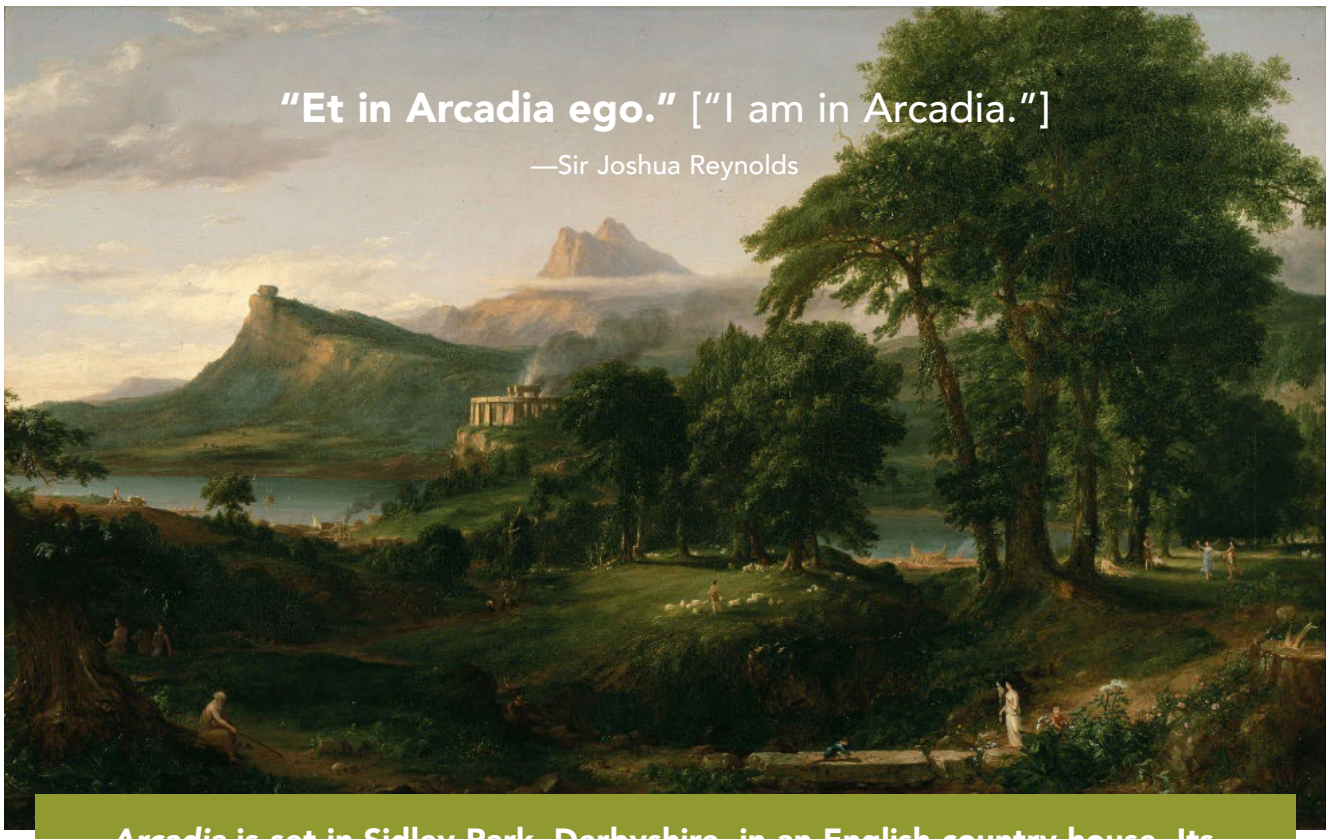
Gus and Augustus Coverly played by Richy Storrs

Everyone has a part of themselves that is silent, a side that plays the role of observer or listener. Often it is when we are speechless or experiencing something that is beyond words that we are most fascinated. For Gus, this part of his mind has become his primary mode of existence and no one knows why. I wonder if even Tom Stoppard knew! In the script, we're told only that he "doesn't speak. He never speaks. Perhaps he cannot speak." What I love the most about Gus is the total sense of mystery that Stoppard gives him without saying much at all. Gus speaks for himself in action alone and, because we're told so little about him, playing the part has been a wonderfully imaginative experience. He is a blank slate, a silent reflection of the world around him. It's an added joy to also be able to play Augustus and work in both time periods of the play.

Thomasina Coverly played by Erika Soto

I love Thomasina's intelligence and determination. Her mind works on so many different planes at once. She understands the world in pictures, images, and numbers. One of my favorite scenes is when she talks to Septimus about her pudding; imagining the jam swirling in her cup, she relates it to the picture of a meteor in her astronomical atlas. This link leads to an amazing discovery she is never able to fully develop. So, a very simple, every day, common occurrence, in her mind, is immediately connected to a bigger, cosmic understanding. Although I could never claim to be as smart as Thomasina (some even consider her a genius), I do connect to her passion. She is an eager learner and is passionate about her contributions to the subjects she is learning about. She trusts her instincts and makes amazing connections among all the things around her—and still remains a young girl, concerned with things like kissing and dancing! What I would most encourage the students to keep in mind is how beautifully the play is written…it is an example of the heat equation itself: One thing slowly going to another until an equilibrium is reached.

Synopsis



***Arcadia* is set in Sidley Park, Derbyshire, in an English country house. Its surrounding gardens are about to be restyled in the "picturesque" Gothic style.**

ACT ONE

The play is set across two time periods: the early years of the 19th century and the present day. The action begins in 1809, with Thomasina Coverly, the 13-year-old daughter of the house, and her 22-year-old tutor, Septimus Hodge. Ezra Chater, a poet and house guest at Sidley Park, accuses Septimus of sleeping with his wife.

Some two hundred years later, historian Hannah Jarvis and professor of literature Bernard Nightingale meet in the same room of Sidley Park in which the previous scenes took place. Hannah is there to investigate a hermit who once lived on the estate. Bernard is trying to uncover a mysterious chapter in the life of the poet Lord Byron. The characters in the present day puzzle over artefacts left by those in the 19th century.

ACT TWO

In the present day, Bernard rehearses a speech on his theory that Lord Byron murdered Ezra Chater. In 1809, early in the morning, Septimus returns from shooting rabbits to a proposition from Lady Croom, Thomasina's mother.

The shifts in time begin to speed up and intersect. To confuse the matter, the present-day characters play dress-ups with costumes from the earlier period. The time period of the past jumps forward a few years to 1812, Thomasina is now 16.

As the characters in the present day continue their research and history takes its course, the revelations come thick and fast.♦

Written by Carl Nilsson-Polias. Reprinted with permission from Sydney Theatre Company. https://www.sydneytheatre.com.au/magazine/posts/2016/february/synopsis-arcadia

Playwright Biography: **Tom Stoppard** | By Dan Rubin

It is a mistake to assume that plays are the end products of ideas (which would be limiting): the ideas are the end products of the plays.

TOM STOPPARD was born Tomáš Straüssler in Zlin, Czechoslovakia, in 1937. In 1939 his family immigrated to Singapore, which Tom evacuated with his mother and brother in 1942 before the World War II Japanese invasion. His father, who remained behind, was killed. Stoppard's mother became a manager of a shoe shop in Darjeeling, India, where Tom met the English language at Mount Hermon (a school run by American Methodists) and his mother met Kenneth Stoppard, a major in the British Army. In 1946, Kenneth brought his new family home with him to Derbyshire, England, and gave Tom the name he still uses today.

I write plays because dialogue is the most respectable way of contradicting myself.

—Tom Stoppard in The New Yorker (1977)

Arcadia depicts the 13-year-old Thomasina as a ravenous student, consuming all the information her tutor can put on her plate; Stoppard, on the other hand, found school distasteful. "The chief influence of my education on me was negative. I left school thoroughly bored by the idea of anything intellectual." He left school at 17 and got a job as a reporter on the *Western Daily Press* in Bristol, where his family had moved. He aspired to become a great journalist, but as a second-string critic he was slowly seduced by the theater. In 1958, he saw Peter O'Toole as Hamlet—"[It] had a tremendous effect on me. It was everything it was supposed to be. It was exciting and mysterious and eloquent"—and by 1960, Stoppard had decided to switch careers. He went down to writing just two columns a week to cover expenses and began his first play, *A Walk on the Water* (later revised and called *Enter a Free Man*). With it, he introduced himself to Kenneth Ewing, who has been his agent ever since.

It was Ewing who had the idea that "there was a play to be written about Rosencrantz and Guildenstern after they got to England." In 1964, on a five-month Ford Foundation grant that paid for him and 19 other young European playwrights to live and write as part of a cultural exchange in a Berlin mansion, Stoppard wrote *Rosencrantz and Guildenstern Meet King Lear*, the one-act first draft of

Tom Stoppard.

Rosencrantz and Guildenstern Are Dead. After the Royal Shakespeare Company and the Royal Court rejected it, Ewing reluctantly allowed university students to perform the play in the Edinburgh Festival Fringe on "a stage the size of a ping pong table." *Observer* theater critic Ronald Bryden hailed it as "the most brilliant debut by a young playwright since John Arden's."

Kenneth Tynan, literary manager of London's National Theatre, requested the script. After conferring with his artistic director, Sir Laurence Olivier, Tynan told Stoppard they wanted it. The National Theatre produced *Rosencrantz and Guildenstern Are Dead* at the Old Vic in April 1967, making the 27-year-old Stoppard the youngest playwright the theater had ever produced. In October, *Rosencrantz and Guildenstern* was the first National Theatre production to transfer to Broadway.

On opening night in New York, Stoppard awaited the reviews at a pub near the theater; as they started to come in, and it was clear they were positive, a bartender winked at the young playwright and said, "Ah, you're in, kid!" The play won the Tony Award for Best Play. Back home, the arrival of the "boy genius" was likened to the Second Coming of Harold Pinter.

THE ORIGINS OF *ARCADIA*

Stoppard has said about his 1946 arrival to the United Kingdom, "As soon as we all landed up in England, I knew I had found a home. I embraced the language and the landscape." (His family lived near the elegant gardens of Chatsworth, which showcased four periods of garden design.) His love of the English language and landscape are apparent in his masterwork, *Arcadia*. In 1989, after a 20-year career writing hits and misses in theater, television, and radio, Stoppard read James Gleick's *Chaos*, and despite the lukewarm reception of *Hapgood* (Stoppard's 1988 experiment with quantum mechanics), the

Playwright Biography: **Tom Stoppard** | By Dan Rubin

playwright "gambled that those who disliked physics might nevertheless be seduced by chaos," writes Ira Nadel in *Tom Stoppard: A Life*.

Stoppard has explained that he always begins his plays with an intellectual idea, and chaos theory—specifically the notion of geometric convergence and periodic doubling—was to be *Arcadia's* kernel (as was the notion of entropy, or the dissipation of energy). But he found it too abstract a concept on its own. In 1990, he visited the home of his friend Paul Johnson (a British historian, political writer, and former editor of the New Statesman) to look through his library for inspiration. Stoppard explained in 1994:

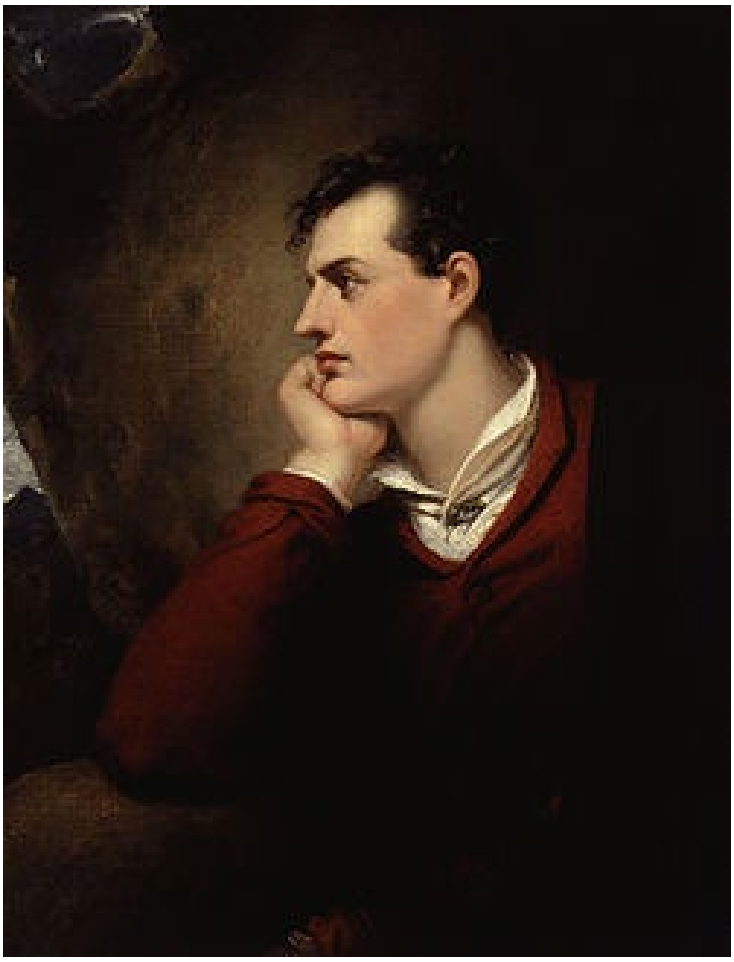
> He has a lot of books. And looking at them I said: "I'm sure there's a play about the difference between Romantic and Classical attitudes and eras." He had some books on Byron on that shelf. I even think I borrowed one or two. I acquire knowledge little by little.

Back home, Stoppard already had books on landscape architecture, mathematics, and hermits in his own collection.

The character of Lord Byron first interested Stoppard when he read a Peter Quennell book about the poet in the 1980s; as he started to envision *Arcadia*, Lord Byron lent himself as an offstage presence. Providing his scientific expertise to the project, Oxford professor of mathematical biology Robert May drew Stoppard's attention to Lord Byron's daughter, the mathematical genius Ada. The playwright has denied basing *Arcadia*'s Thomasina on Ada Byron, but the parallels are notable even if—perhaps especially if—they are coincidental.

Originally, Stoppard thought to call his play by the full Latin phrase "Et in *Arcadia* ego," which appears in two famous seventeenth century Poussin paintings, both of which depict three Arcadian shepherds and a woman gathered around a sarcophagus with this inscription chiseled into it. The literal translation is "Even in *Arcadia* here I [Death] am," suggesting that death exists even in paradise. Nadel writes, "Stoppard wanted the presence of death in the title, but brevity and box-office sense prevailed: 'death is now in the title only by imaginative extension,' he confessed."

In April 1993, Stoppard opened *Arcadia*— which he called "a thriller and a romantic tragedy with jokes"—at the National Theatre, which had committed to the play before a word had been written. Trevor Nunn directed and Professor May tutored Samuel West (who played Valentine), Emma Fielding (who played Thomasina), and the rest of the cast in chaos theory and mathematical modeling. May's graduate student Alun Lloyd even developed the "Coverly Set" for the show: a simple formula that creates the complex leaf shape Thomasina discovers in the play.



Westall, Richard. *Lord Byron*. 1813. National Portrait Gallery, London.

Arcadia was a popular and critical success. The production won both the Evening Standard and Olivier awards for best play of the year; it ran for two seasons (431 performances). The script, available for purchase at the National Theatre's bookshop, outsold all other plays in print, including Shakespeare: 6,000 copies were sold in the first three weeks of the run. "*Arcadia* marked a watershed," writes Nadel. "It reaffirmed Stoppard's importance in the theater, not just in Britain but beyond." ♦

This article by Dan Rubin first appeared in American Conservatory Theater's performance guide series, Words on Plays, in 2013. For more information about Words on Plays, visit www.act-sf.org/wordsonplays.

Tom Stoppard Timeline

1937 — Tomas Straussler is born in Zlin, Czechoslovakia on July 3.

1939 — When Nazis invade Czechoslovakia, the Straussler family escapes to Singapore.

1942 — Before the Japanese invasion of Singapore, Tomas, his mother, and brother are evacuated to India. His father is killed in the invasion.

1945 — His mother marries Kenneth Stoppard, a British Army officer. The family moves to England, settling in Bristol, where Kenneth Stoppard adopts his two stepsons.

1954 — Stoppard chooses to skip university and becomes a cub reporter for the Western Daily Press, Bristol.

1958 — Stoppard joins the Bristol Evening World as news reporter, feature writer, and theater and film critic.

1960–1961 — Stoppard quits the newspaper to write his first play, *Walk on the Water*, followed by *The Gamblers* and *The Stand-Ins.* He remains a freelance journalist for three years.

1962–1963 — Stoppard becomes the theater critic for the Scene, London, using the pseudonym, William Boot.

1965 — Stoppard marries Jose Ingle, a nurse.

1966 — *Rosencrantz and Guildenstern Are Dead*, revision of an earlier one-act play, is performed on the Edinburgh Fringe Festival. His novel *Lord Malquist and Mr Moon* is published.

1967 — The US premiere of *Rosencrantz and Guildenstern Are Dead* opens at the Alvin Theatre, transferring to the Eugene O'Neill Theatre in 1968. It wins the Tony Award for Best Play of the Year.

1968 — *Enter a Free Man* is produced at the St. Martin's Theatre, London, *The Real Inspector Hound* is produced at the Criterion Theatre, London.

1970 — The first US production of *The Real Inspector Hound* opens at Brown University, Providence RI. Stoppard writes a screenplay loosely based on Brecht's *The Life of Galileo*.

1972 — The National Theatre production of *Jumpers* opens at the Old Vic. Stoppard divorces Jose Ingle and marries Miriam Moore-Robinson.

1977 — The New York Times publishes "Dirty Linen in Prague" concerning repression in Czechoslovakia. Stoppard travels to Moscow and Leningrad with a group from Amnesty International.

1978 — Stoppard is honored as a CBE (Commander of the Order of the British Empire).

1980 — The film of Stoppard's screenplay of *The Human Factor* is released.

1984 — The US premiere of *The Real Thing*, opens at the Plymouth Theatre, NYC, winning the Tony Award for Best Play.

1992 — Stoppard's marriage to Miriam Stoppard ends in divorce. He openly courts actress Felicity Kendal, who appeared in several of his previous productions. The first attempt at filming his screenplay of *Shakespeare in Love* falls through.

1993 — The National Theatre production of *Arcadia* opens.

1995 — The US premiere of *Arcadia* opens at the Vivian Beaumont Theatre at Lincoln Center, NYC.

1997 — Stoppard's adaptation of Chekhov's *The Seagull* is performed at the Old Vic, London. Stoppard is knighted on December 12 and becomes Sir Tom Stoppard.

1998 — Stoppard writes a screen adaptation (unproduced) of his 1993 stage play, *Arcadia*. The film *Shakespeare in Love* opens in December.

1999 — Stoppard wins an Academy Award for his screenplay of *Shakespeare in Love*.

2001 — The New York Shakespeare Festival production of *The Seagull* opens, directed by Mike Nichols.

2005 — Stoppard creates a half-hour stage version of William Shakespeare's *The Merchant of Venice* for young actors.

2007 — The American premiere of *Heroes* opens at the Geffen Theatre, Los Angeles. *The Bourne Ultimatum*, the film of TS's screenplay (co-written with Tony Gilroy) is released.

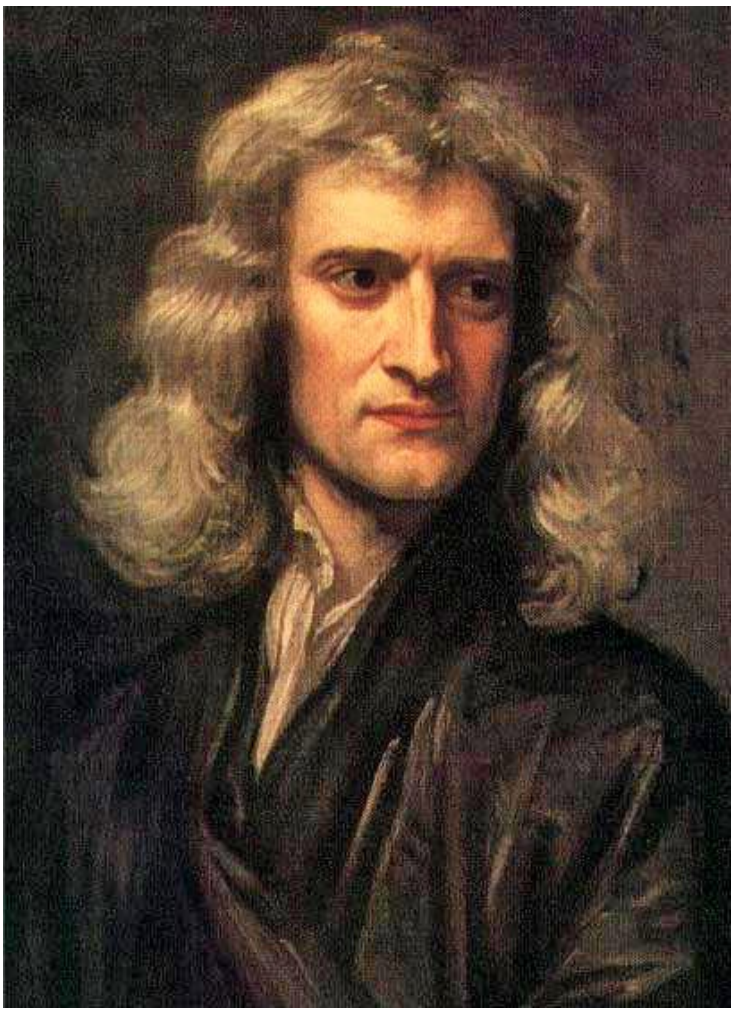
2012 — Stoppard adapts Ford Madox Ford's novel *Parade's End* for an HBO miniseries, and Leo Tolstoy's *Anna Karenina* as a screenplay.

2016 — A revival of Stoppard's play *Travesties* is planned for the fall at Menier Chocolate Factory theatre in London. His film adaptation of the novel *Tulip Fever* by Deborah Moggach is released in April.

Arcadia: **Themes & Ideas**

FIRST THERE WAS NEWTON... Prior to the development of chaos theory, Isaac Newton organized the forces of the natural world into a set of rules and laws. His theories deemed the entire natural world and universe as predictable using a mathematical linear equation. Newton and his scientific followers believed anything that was more complex and not entirely solvable through those linear equations just needed a more complex equation, but was ultimately able to be predicted. Newton's laws were saying that the future was pre-destined and fixed with no room for random events or chaos. Today, we know this is definitely not the case. In the 1800s, Septimus addresses the limitations of Newton's theories when he says "If everything from the furthest planet to the smallest atom of our brain acts according to Newton's law of motion, what becomes of free will?" (Arcadia, 9). Thomasina also starts to think about the validity of Newton's laws and asks whether God, who created the Earth, was a Newtonian. Knowing full-well that this couldn't have been the case, she says "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" (Arcadia, 9).

THEN THERE WAS CHAOS... What chaos theory did was turn this paradigm on its head. A simple computational oversight by mathematician and meteorologist Edward Lorenz showed that seemingly insignificant changes in the initial conditions of a system (such as the weather) can have huge ramifications. It's a phenomenon now widely referred to as 'the butterfly effect,' the idea that a butterfly disturbing the air today in Sydney might magnify a storm system next month in Madrid. Soon, chaotic behavior began to be recognized throughout the natural world: in the movements of planets, the fluctuations in insect populations, shifts in ocean temperature, the rhythms of a beating heart, the turbulence of a river's flow, and in the basic geometry of nature itself. The fuzziness (or complexity) of systems was far from peripheral. Rather, it was the very distortions of things like clouds and mountains—the ways they failed to comply with simple geometrical shapes (such as circles and cones)—which were crucial to our understanding of the way the universe worked. Thomasina also notices this and says, "Each week I plot your equations dot for dot, xs against ys in all manner of algebraical relations, and every week they draw themselves as commonplace geometry, as if the world of forms were nothing but arcs and angles. God's truth, Septimus, if there is an equation for a curve like a bell, there must be an equation for one like a bluebell and if a bluebell, why not a rose?" (Arcadia, 51). The algebra Thomasina talks of for making bluebells and roses (natural shapes that are not lines or circles) is called Fermat's Last Theorem and uses iterated algorithms or fractals to create the pattern of the shapes. Fermat wrote in the margin of a book he was reading, *Arithmetica*, that he had discovered the proof for this idea but the margin was too small for him to write it. This theorem remained unsolved until 1993 when it was proven by a Princeton University student (the same year *Arcadia* was written). Valentine is also using iterated algorithms to create an equation about population changes in grouse at Sidley Park. Chaos theory became a means by which apparently random and chaotic behaviors could be reconciled with notions of order and organization. Within disorder, 'islands of structure' existed—think of something like the Great Red Spot that is a constant feature of Jupiter's ever-swirling storms. It was "one coin with two sides. Here was order, with randomness emerging, and then one step further away was randomness with its own underlying order." It was a world of repeating patterns, periodic behavior, branching structures, feedback loops, symmetry and self-referentiality (all of which Stoppard utilized in *Arcadia's* composition). Scientists also began to see consequences beyond the immediate realm of experimental science. A universe governed by determinism—a universe that adhered to Newton's clockwork mechanism and all that implied about our



Issac Newton.

capacity to shape our own destiny—by necessity negated the concept of free will. However, within the paradigm of deterministic chaos, free will again seemed a possibility: "the system is deterministic, but you can't say what it's going to do next." (The above information was written by Diane Stubbings for the Sydney Theatre Company, 2016.) In *Arcadia*, the chaos and indeterminate nature of the universe is explained by Valentine using the idea of "noise" alongside the metaphor of a piano. "It's all very noisy out there. Very hard to spot the tune. Like a piano in the next room, it's playing your song, but unfortunately it's out of whack, some of the strings are missing, and the pianist is tone deaf and drunk—I mean, the noise, it's impossible. You start guessing what the tune might be. You try to pick out the noise." (Arcadia, 63). This speech by Valentine is delivered as Gus 'plays' the piano in the next room which similarly has no tune or melody, symbolizing chaos. When Hannah asks Valentine what Gus is playing on the piano he says "I don't know he makes it up. Chloe called him genius" (Arcadia, 65). Valentine continues to relish the amazement of scientific discovery. Where a new discovery surpasses old thinking, rather than being fearful of the unknown he remains optimistic, saying: "A door like this cracked open five or six times since we got up on our hind legs. It's the best possible time to be alive, when almost everything you thought you knew is wrong" (Arcadia, 65). He continues by saying that "What matters is the calculus. Scientific progress" (Arcadia, 83).

THE SECOND LAW OF THERMODYNAMICS

At the conclusion of *Chaos*, James Gleick considers what connection might exist between chaos and the second law of thermodynamics. The science of thermodynamics—the study of the relationship between heat and energy—began in the 18th-century and arose out of a desire to improve the efficiency of the steam engine. The first commercially successful steam engine—a device designed to remove water from mines—had been invented in 1712 by Thomas Newcomen. Decades later, while repairing a Newcomen Steam Engine, James Watt hit upon a means of making the steam engine more flexible, more efficient, and cheaper to run, thus providing the mechanical impetus for the Industrial Revolution. The quintessence of thermodynamics is the second law. Put simply, it states that "the spontaneous flow of heat is unidirectional, moving from a warm body to a cold one." An ice cube dropped into your drink will melt; it won't make your drink freeze. What the second law also implies is that it's impossible to build an engine that will be one hundred percent efficient—some energy will always be lost as heat (something Thomasina Coverly in *Arcadia* intuits decades before it will be officially discovered). This, in turn, leads to the notion of entropy, which maintains that all systems—the universe included–experience a gradual decline into disorder, as the energy available to that system becomes less and less useable. Scientist and novelist C.P. Snow asserted that "not knowing the second law of thermodynamics is like never having read the work of Shakespeare," while astrophysicist Arthur Eddington argued it was the most important law in nature—more important than relativity, quantum physics or Newton's laws. With its contention that "the past was more ordered and the future will be less ordered" it has implications for our understanding of the Big Bang, the expansion of the universe and, vitally, the inevitable drift of the universe towards 'heat death.' Even so, within this universe that is slowly winding down, we still witness the endlessly transformative dance of life—the linking of atoms, the intricate growth of plants, the formation of stars. The patterns that chaos theory has taught us to recognize—the "evolving islands of order"—highlight that despite the extinction predicted by the second law of thermodynamics, life forges on. Stoppard has incorporated this idea of the "dance of life" at the end of the play when Thomasina insists on learning to waltz with Septimus. As they waltz, Gus and Hannah also begin to dance and the lights go down.

(The above information was written by Diane Stubbings for the Sydney Theatre Company, 2016.)

ROMANTICISM AND THE ENGLISH LANDSCAPE GARDEN

"There's more than one point of origin for a play," Stoppard has said, "and the only useful metaphor I can think of for the way I think I write my plays is convergences of different threads." What converged with Stoppard's reading of chaos theory was a long-held inkling that there was a play to be written about the differences between the romantic and classical temperaments, an idea that coalesced when he happened upon a biography of Byron in a friend's study. Byron was the epitome of the Romantic poet. By 1809 (the year in which much of the action of *Arcadia* is set), Byron had published one volume of poetry, but he was largely known for his satire *English Bards and Scotch Reviewers*, in which he attacked the literary establishment. He was soon to produce *Childe Harold's Pilgrimage*, giving to the world the original Byronic hero, 'a moody, passionate, and remorse-torn but unrepentant wanderer.' Romanticism was "preoccupied with revolution"—with energy and experiment—and, according to the poet William Wordsworth, it was marked by "the spontaneous overflow of powerful feelings." In this, it was at odds with the classical temperament (which had held sway through the 18th-century) which advocated the importance of order, rationality, and logic. The Romantics responded to the world not on the basis of their reason and intellect, but through their perceptions, emotions, and imaginations. The English landscape garden was one aspect of life where these differences between the Classical and Romantic temperaments were most striking. In the 18th-century the landscape garden had

Arcadia: **Themes** continued...

undergone a transition, from a formal, aristocratic style (designed to assert man's dominance over nature) to one where the imprint of the landscape gardener—Lancelot 'Capability' Brown was widely recognized as the master of the form—was virtually invisible. Artificial lines were abandoned in favor of a more natural landscape: the ha-ha, a constructed ditch that gave the illusion of fields coming right up to the house (while still keeping livestock at a distance) was a prime example of how the ideal worked in practice. With the advent of Romanticism, the landscape garden was again transformed. Brown's subtle renderings of the 'natural' landscape were too tame for the romantic imagination, and wilder landscapes—of unrestrained vegetation, follies and mock ruins—as evinced in the paintings of seventeenth-century Italian painter Salvator Rosa, became all the rage. It is just such a metamorphosis that the gardens of Sidley Park are undergoing when we arrive in *Arcadia.*

(The above information was written by Diane Stubbings for the Sydney Theatre Company, 2016.)

LOSS

The concept of loss runs throughout *Arcadia*. This is not necessarily loss in the sense of death and grief (although we do know Thomasina dies), but loss in the sense of what is lost to history and times past. As time moves on things are left behind, forgotten, cast aside, or disappear. This is seen with Thomasina, whose glimpses of mathematical and scientific breakthrough with Chaos and Fermat's Last Theorem are lost with her premature death. Thomasina herself laments works of genius lost to history when she talks about Cleopatra saying "...but instead the Egyptian noodle made carnal embrace with the enemy who burned the Library of Alexandria without so much as a fine for all that is overdue. Oh, Septimus!—can you bear it? All those lost plays of the Athenians! Two hundred at least by Aeschylus, Sophocles, Euripides..." (Arcadia, 52). Septimus refutes this and believes that something lost is not lost indefinitely; just left to be found again by someone else. "You should no more grieve for the rest than for a buckle lost from your first shoe, or for your lesson book which will be lost when you are old. We shed as we pick up, like travelers who must carry everything in their arms, and what we let fall will be picked up by those behind. The procession is very long and life is very short. We die on the march. But there is nothing outside the march so nothing can be lost to it." (Arcadia, 53). His speech also relates to the idea that scientific and mathematical theories take a long time to be solved and discovered—much longer than one human's lifetime. But because we all live in the same world, someone else will pick it up and continue on. This was seen with Fermat's Last Theorem, which wasn't solved until the same year *Arcadia* was written - 1993.

PROOF VS. ASSUMPTION

The tension in Arcadia is centered around finding the proof of Sidley Park's history. The idea and importance of proof is different for various characters and changes across the course of the play as discoveries are made. For the audience, the proof of what happens in the past unfolds through the dramatic structure of Arcadia that jumps in time and place between a room in Sidley Park in the 1800s and the Sidley Park room of today. In the present day, Hannah is trying to prove the existence of the hermit, while Bernard is trying to prove that Lord Byron visited Sidley Park and to discover why he left England so suddenly in 1809. Meanwhile, Valentine is trying to create a formula to determine the pattern in the population distribution of grouse at Sidley Park. Discovering the truth of past events is complicated by the opposing views of Hannah and Bernard. The two characters argue about the importance of needing exact proof, or whether a theory or assumption is good enough. Bernard believes you can't prove anything unless you were there, saying to Hannah "Proof? Proof? You'd have to be there you silly bitch!" (Arcadia, 66). He also believes all you need is guts and confidence in what you are assuming—"...by which I mean a visceral belief in yourself. The part of you which doesn't reason. The certainty for which there is no back—reference."(Arcadia, 68). This way of thinking backfires on Bernard when he presents a paper claiming Lord Byron killed Mr. Chater at Sidley Park after having an affair with Mrs. Chater, which is what he believed caused Byron to flee England soon after. This was in fact not true as it was discovered that Mr. Chater died from a monkey bite in the West Indies. Hannah on the other hand, believes there must be absolute proof before a theory is presented to the world. She is disgusted by Bernard's flippant thinking saying "you've gone from a glint in your eye to a sure thing in a hop, skip and a jump" [...] "...your theory is incomplete. But I'm not a scientist" (Arcadia, 80-81). The world of the play also encompasses many theories which we see glimpses of in the 1800s that across the course of time have been discovered and solved and are now spoken about and used by characters in the present day. These include chaos theory and Fermat's Last Theorem. An example of this is Valentine attempting to use Fermat's Last Theorem to discover the trends in the rise and fall of grouse populations at Sidley Park. ♦

Edited from: Brown, Hannah. (2016). On Cue Arcadia. Sydney Theatre Company. Accessed via https://www.sydneytheatre.com.au/community/education/resources/education-resources/arcadia-resources

Classicism and Romanticism in Sidley Park

"Our urge to divide, counter balance and classify has never, perhaps, produced two denominations which work so suggestively over the infinite terrain of human expression. In speaking of Classical and Romantic literature, painting, music, sculpture, architecture or even landscape-gardening, we balance reason against imagination, logic against emotion, geometry against nature, formality against spontaneity, discretion against valor...But in so doing, we are drawing attention not so much to different aesthetic principles as to different responses to the world, to different tempers. 'Romanticism' is an idea which needed a classical mind to have it."

—Tom Stoppard

The whole Romantic sham, Bernard! It's what happened to the Enlightenment, isn't it? A century of intellectual rigour turned in on itself. A mind in chaos suspected of genius. In a setting of cheap thrills and false emotion. The history of the garden says it all, beautifully. There's an engraving of Sidley Park in 1730 that makes you want to weep. Paradise in the age of reason. By 1760 everything had gone—the topiary, pools and terraces, fountains, an avenue of limes—the whole sublime geometry was ploughed under by Capability Brown. The grass went from the doorstep to the horizon and the best box hedge in Derbyshire was dug up for the ha-ha so that the fools could pretend they were living in God's countryside. And then Richard Noakes came in to bring God up to date. […] The decline from thinking to feeling, you see.

—Hannah

"The grounds of Sidley Park, the house which provides the setting for *Arcadia*, are a palimpsest on which all three of the main styles of 18th and early 19th century landscape garden have at one time or another been inscribed. Until the 1750s, the garden was laid out according to an aesthetic which saw beauty only in symmetry, in the geometrical pattern made by circular pools and the intersecting straight lines of avenues, allées, terraces, hedges. This formal design was then buried beneath the improvements of Lancelot ('Capability') Brown, the most famous advocate of a 'natural' style of gardening which saw beauty only in asymmetrical arrangements of sinuous curves and trees planted in loosely, scattered informal groups. As *Arcadia* opens, this design is about to give way to the 'picturesque' style favored by Mr. Noakes. The 'picturesque' was an aesthetic of irregularity, of 'romantic' wildness, in which the continuous, serpentine lines of Brown were deliberately broken and obscured by sudden declivities and the jagged shapes and shadows of rocks and unkempt trees."

Excerpted from the program for Arcadia's 1993 world premiere at the National Theatre, London, by John Barell.

Math and Science in *Arcadia*

> "The unpredictable and the predetermined unfold together to make everything the way it is. It's how nature creates itself, on every scale, the snowflake and the snowstorm."
>
> *—Valentine*

NEWTONIAN PHYSICS

In 1687, English mathematician and physicist Sir Isaac Newton published his seminal *Philosophae Naturalis Principia Mathematica*, which describes universal gravitation (the gravitational attraction between bodies with mass) and the three laws of motion. Newton's laws state that every object in motion will stay in motion until acted upon by an outside force, that force equals mass times acceleration (F = ma), and that every action causes an equal and opposite reaction. Newton's work proved that both the motion of celestial bodies and objects on earth could be predicted through the same series of equations. Newton also made significant contributions to mathematics (including the development of calculus) and to the studies of light and sound. His empirical law of cooling, cited by Valentine in *Arcadia*, states that all objects will eventually cool or warm to the temperature of their surroundings.

Newton's laws and the laws of gravity supported the idea that the universe functioned like a clock, a perfect ordered machine within which everything that happened on earth or in the solar system could be predicted and explained. Newton's explanation of the universe falls in line with *determinism*, the belief that all events are caused by previous circumstances and that people have no real ability to make choices or control what happens.

FERMAT'S LAST THEOREM

FERMAT'S THEOREM

For integers n > 2 the equation

$a^n + b^n = c^n$

cannot be solved with positive integers a, b, c.

Pierre de Fermat (1601–65) was a French mathematician. Fermat's Last Theorem holds that "it is impossible to separate a cube into two cubes, a fourth power into two fourth powers, or, generally, any power above the second into two powers of the same degree." Fermat claimed to have found "a remarkable proof which the margin is too small to contain." Mathematicians sought to find this proof for more than 350 years. Many thought it was impossible, until Princeton University–based British mathematician Andrew Wiles solved it in 1993 after seven years of concentrated effort. His discovery was announced two months after *Arcadia* debuted in London; Stoppard insisted the performance program be reprinted to include an article about the finding.

> "[Stoppard's] purpose is to explore the unpredictability of passion, the clash of rationality and emotion, the way that chaos can emerge from logic; and he shows how certain mathematical ideas reflect and resonate with these themes."
>
> *—Allyn Jackson, Love and the Second Law of Thermodynamics: Tom Stoppard's* Arcadia

CHAOS THEORY

For Want of a Nail

For want of a nail the shoe was lost.
For want of a shoe the horse was lost
For want of a horse the rider was lost
For want of a rider the message was lost.
For want of a message the battle was lost.
For want of a battle the kingdom was lost.
And all for the want of a horseshoe nail.

Chaos theory is the study of seemingly random behavior in a system that's governed by deterministic rules. A system is deterministic if its present completely determines its future. Chaos theory shows that even when laws are determined and there is no "noise," as Valentine phrases it in *Arcadia*, there is still an element of unpredictability. Any slight uncertainties, any unknown effects in the initial starting conditions can amplify and snowball so rapidly that things become unpredictable. This was a known concept for centuries, take for example the old proverb "For want of a nail…", but wasn't expressed mathematically until the later half of the 20th century. This effect is also commonly referred to as the "Butterfly effect." *(See below)*

Dr. Steven Strogratz, professor at the Cornell University School of Theoretical and Applied Mathematics, explains in an interview with LA Theater Works that the negative side of chaos theory is that even systems previously thought to have order, if the conditions are slightly altered, will behave unpredictably. But, he says, the positive side is that chaos theory shows that there may be order in systems that appear seemingly random. For example, in something like arrhythmia of the heart (abnormal heartbeat), there might be a kind of pattern that, if studied and discovered, could help doctors produce a better defibrillator.

Math and Science in *Arcadia*

THE BUTTERFLY EFFECT

The phrase was coined by meteorologist Edward Lorenz. The idea is that something as seemingly insignificant as the flapping of a butterfly's wings could create tiny changes in the atmosphere that may ultimately alter, delay, accelerate or even prevent the occurrence of a huge weather event such as a tornado in a completely different location.

FRACTALS

> *"Each week I plot your equations dot for dot, […] every week they draw themselves as commonplace geometry, as if the world of forms were nothing but arcs and angles. …If there is an equation for a curve like a bell, there must be an equation for one like a bluebell, and if a bluebell, why not a rose? Do we believe nature is written in numbers?"*
>
> —Thomasina Coverly, *Arcadia*
>
> *"Clouds are not spheres, mountains are not cones, coastlines are not circles, and bark is not smooth, nor does lightning travel in a straight line."*
>
> —Benoit Mandelbrot, *The Fractal Geometry of Nature*

Thomasina is describing fractals, a type of geometry that would not be fully developed until the 1970s by Benoit Mandelbrot. He fed mappings of nonlinear equations (created by mathematician Gaston Julia during WWI) into a computer and iterated them thousands of times, and the results were new geometric forms that Mandelbrot termed "fractals." Fractals, he explained, "are objects, whether mathematical, created by nature or by man, that are called irregular, rough, porous or fragmented and which possess these properties at any scale. That is to say they have the same shape, whether seen from close or from far." Fractals allow us to mathematically describe objects in nature like a leaf or a bluebell, and show that there is complex order existing within the seeming disorder of the natural world.

THE FRACTAL STRUCTURE OF *ARCADIA*

The self-similarity of fractal construction is […] abundant in Stoppard's text. Self-similarity of dialogue, situations, characters, props, costumes, and musical accompaniment are all evident; indeed, it is the aspect of deterministic chaos that Stoppard uses most frequently. One way Stoppard achieves the effect of self-similarity is through a series of recurring topics mostly revolving around sex, literature, science, and gardening. At the same time, Stoppard carefully constructs the play so that its structure involves a dynamic interplay between intellectual ideas, a more human/emotional component, and entertaining elements in the form of jokes and literary detective story.

Joseph Wright of Derby, *A Philosopher Giving A Lecture at the Orrery* (piece of art from the Enlightenment)

The nonlinear bouncing between time periods suggests disorder, yet lurking underneath is a tightly ordered dramatic structure. There are seven scenes—three in the past, three in the present, and the chaotic seventh scene where the periods mix. Within that scene there are six sub-scenes: two of only the past, two of only the present, and two where the different periods share the stage. Thus, as with chaotic systems in the physical world, there are a series of bifurcations but even within the chaotic region, there are pockets of order, and so overall, this nonlinear play exhibits a fine, underlying structure. ♦

Excerpted from: "It's wanting to know that makes us matter": Epistemological and Dramatic Issues in Tom Stoppard's *Arcadia* by John Fleming

Order and Disorder:
Classical and Romantic Physics in *Arcadia*

By Dr. Mary Crone Odekon

IS LIFE A SERIES OF conflicts between thinking and feeling, between order and disorder, between the Classical and the Romantic? Stoppard suggests that our interpersonal relationships and aesthetic preferences are driven by this dichotomy, and even goes so far as to suggest that our picture of the physical universe is, as well.

In *Arcadia*, simple Newtonian physics represents Classicism. This "clockwork" view of the universe considers forces between a small number of objects in a controlled environment, and provides a metaphor for control, logic, and the picture of the world as orderly and unchanging. Two fields within physics represent Romanticism: the second law of thermodynamics, which was new in the nineteenth century; and chaos theory, which scientists and mathematicians have studied recently through the use of computers. These two fields are actually both outcomes of Newton's formulation of physics, and are therefore sometimes called "Classical" by physicists, although they represent Romanticism here. What makes these two fields different is that they deal with situations in the real world more complicated than a small number of objects in a controlled environment. In the case of thermodynamics, the difference is that a large number of objects are involved, like molecules in the air. In the case of chaos theory, the difference is that the system is very sensitive to small variations in the environment which we cannot predict.

One way to summarize the second law of thermodynamics is to say that disorder increases. In this context, "disorder" has a specific technical definition which is often stated in terms of the temperature and energy of a system. In physics, this kind of disorder is called "entropy." A good simple way to think about entropy is randomness. For example, if you have 10 white balls and 10 yellow balls and you throw them into a box at random, it is likely that the colors will be pretty well mixed together, and unlikely that all the white balls will be at one end and all the yellow balls at the other. The reason the disordered state is more likely is simply a matter of statistics; there are many combinations of positions of the balls which look disordered, and only a few which look ordered. The second law of thermodynamics states that over time, systems tend to go into disordered states. If you start with many boxes of balls, some in ordered states, and other in disordered states, and shake them all around for a while, they will probably all look disordered in the end. In other words, entropy increases.

The second law sometimes seems puzzling because although is it mathematically consistent with Newton's laws for two bodies interacting, its implications are somewhat different. As summarized by Valentine, "... you can't run the film backward. Not like Newton." In other words, if you watch a movie of two balls colliding, there is no way of telling whether the movie is running backwards or forwards. On the other hand, if you watch a movie of many colored balls bouncing around, and it starts with all the yellow balls on one side and all the white balls on the other, and its ends with the colors mixed up, it is extremely likely that the move is running forwards rather than backwards.

"On the Threshold," Edmund Blair Leighton

Another reason the second law seems puzzling is that disorder does not always seem to increase; for example, we can pick up balls and put them in order. However, when we interact with the balls, we are making the situation more complicated. We expend energy to do this, our bodies produce heat which emanates out into the room, and this heat is an example of disorder! Think of the molecules in the air as balls and the temperature of the molecules as color. As the heat diffuses through the room, the temperature evens out, and entropy increases.

Finally, think about the implications of the second law when applied to all the atoms in the universe. Once again consider the color of the balls to indicate temperature. Then the implication is that the temperature at each

Four couples dancing a quadrille (from a nineteenth-century print)

location in the universe will eventually even out, although the eventual temperature might actually be something we would consider cold instead of hot! The point is that as the heat spreads out and entropy increases toward its maximum, what is left? Maybe maximum disorder means that nothing interesting ever happens again.

Thomasina remarks early in the play that disorder increases; she can stir jam and pudding together, but she cannot "stir them apart." More importantly, she realizes how profound this statement is --- that its implications go beyond the physics understood at her time. In the culminating scene, she makes the conceptual breakthrough that the performance of the heat engine illustrated by the "diagram" she is studying, is limited by the increase in entropy. In a heat engine, energy in the form of heat is converted to work (in this technical sense, "work" means forcing an object to move some distance). For example, heated steam may be used to expand and move a piston. Because heat is a more disordered form of energy than is work, the engine cannot convert heat to work with 100% efficiency without violating the second law of thermodynamics.

The role of physics in *Arcadia* is not only to illustrate Thomasina's genius, but to reflect the mentalities and the twists of fate in this story. As you read the play, notice how Stoppard uses thermodynamics to suggest that there is no "going back," and also how he uses chaos to suggest that people's lives are not simple and predictable. In the final scene, think about the double meaning of "heat death" and for Thomasina and Septimus: "Everything is mixing all the time, the same way, irreversibly... till there's no time left." ◆

Reprinted with permission from Dr. Mary Crone Odekon.

Koehler, Mela. (Austrian, 1885-1960.) *Dancing couple, with musical notation.* Museum of Fine Arts, Boston.

Dr. Crone Odekon is an astrophysicist who studies the formation of galaxies and large-scale structure in the Universe. She earned her B.S. from the College of William & Mary and her Ph.D. from the University of Michigan. She has also done research at the Harvard-Smithsonian Center for Astrophysics, the University of Washington, and the University of Pittsburgh. She now holds the Charles Lubin Family Chair for Women in Science.

Fun Fact: Thomasina Coverly and Ada Lovelace

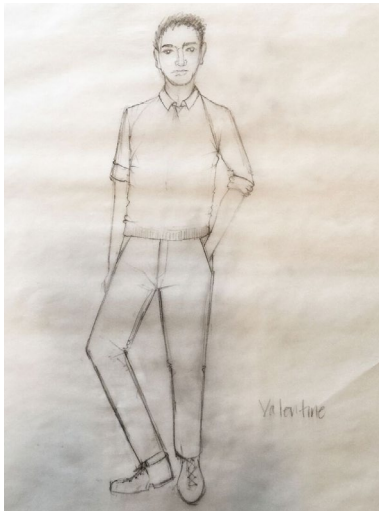
DID YOU KNOW? It is widely believed that the character of Thomasina Coverly in *Arcadia* is loosely based on Ada Lovelace, an English mathematician in the 1800s. Many people actually regard her as the first computer programmer! Though Stoppard has actually denied the connection, Lovelace was the daughter of the famous poet, Lord Byron, an historical figure who is heavily featured (though never actually appears) in *Arcadia*. Ada's mother, Lady Anne Isabella Milbanke Byron, separated from Lord Byron when Ada was young and gave her a rigorous mathematical and scientific training. Ada never knew her father and her mother did everything in her power to keep his poetic influence away from her. As a teenager, Ada was mentored by Charles Babbage, who is known as the father of the computer. Babbage invented the difference engine and the analytical engine—both designed to complete mathematical functions. Ada wrote extensively on Babbage's inventions, particularly about how certain codes could be developed and programmed into these engines in order to expand the scope of what they could do. She is also credited with inventing a process known today as "looping." Pretty cool, huh? ♦

Costume Renderings and Research | Costume Designer: Leah Piehl

CHLOE COVERLY



VALENTINE






SEPTIMUS HODGE

Costume Renderings and Research continued...

LADY CROOM

THOMASINA COVERLY

Arcadia **Glossary**

Anchorite: An anchorite is a hermit who has retired to a solitary place for religious seclusion.

Brocket Hall and Caroline's Garden: Brocket Hall was built by renowned architect James Paine for Sir Matthew Lamb in 1760. Sir Matthew's grandson was William Lamb, husband of Caroline Lamb.

"Capability" Brown (1716–83): Considered the master of English landscape architecture, Lancelot "Capability" Brown was an avid disciple of the "picturesque" style of garden design, characterized by a natural, unplanned appearance. He disliked carved stone and architectural shapes. Instead he used only natural elements in his designs: turf; mirrors of still water; a few species of trees used singly, in clumps, or in loose belts; and the natural undulating contours of the ground. His nickname is derived from his habit of saying that each estate he was asked to redesign had "capabilities."

Samuel Taylor Coleridge (1772–1834): English poet, critic, philosopher, and leader of the British Romantic movement.

Don: Senior member of a college at a British university, especially at Oxford or Cambridge. This is not the title of a position (like lecturer, reader, or professor) but a term of respect deriving from the Latin *dominus* ("master").

Dwarf Dahlia: Diverse and versatile, dahlias are flowers prized for their large, often spectacularly colored and shaped blooms. Dwarf dahlias are the smallest members of the family, standing at about 8" tall.

"English Bards and Scotch Reviewers": Satirical poem by Lord Byron first published anonymously in 1809. It was written in response to the *Edinburgh Review*'s unfavorable review of Byron's first volume of poetry, *Hours of Idleness*. The poem went through several editions, but Byron came to regret his vitriol and suppressed the fifth edition in 1812.

Enlightenment: The European cultural and intellectual movement known as the Enlightenment occurred during the 17th and 18th centuries. Central to Enlightenment thought was the use and the celebration of reason. This period produced Europe's first modern secularized theories of psychology and ethics.

Et in Arcadia ego!: This phrase appears in two paintings from the mid-1600s, both titled Arcadian Shepherds, by Nicolas Poussin (1584–1665). They depict three shepherds and a woman gathered around a tomb with the inscription "Et in Arcadia ego," alternately translated as "I, who am now dead, also lived once in Arcadia" or, "I, Death, exist even in Arcadia." It serves as a reminder that death exists in even apparently idyllic circumstances.

Euclid (325–265 BC): Greek mathematician who applied deductive principles of logic to elementary plane geometry and used this method to derive statements from clearly defined axioms.

Fermat's Last Theorem: Pierre de Fermat (1601–65) was a French mathematician. Fermat's last theorem holds that "it is impossible to separate a cube into two cubes, a fourth power into two fourth powers, or, generally, any power above the second into two powers of the same degree." Fermat claimed to have found "a remarkable proof which the margin is too small to contain." Mathematicians sought to find this proof for more than 350 years. Many thought it was impossible, until Princeton University–based British mathematician Andrew Wiles solved it in 1993 after seven years of concentrated effort. His discovery was announced two months after *Arcadia* debuted in London; Stoppard insisted the performance program be reprinted to include an article about the finding.

Gothic Novel: The European Gothic novel is characterized by its atmosphere of mystery and terror. The term "Gothic" is derived from the genre's preoccupation with medieval architecture. Iconic examples include Horace Walpole's *Castle of Otranto* and Ann Radcliffe's *Mysteries of Udolpho* and *The Italian*. The style's heyday was the 1790s, but many Gothic revivals followed.

Grouse: A brown bird slightly larger than a partridge. The British shoot thousands each autumn; the shoots, particularly in the late Victorian and Edwardian eras, were massive social affairs.

Ha-ha: A sunken barrier along the perimeter of one's property meant to keep farm animals and wildlife out without disrupting the scenery with obtrusive fences or hedges. The term comes from the exclamation one makes when one comes upon one unexpectedly—and falls in.

Heat Exchange: This refers to the second law of thermodynamics, which states, in essence, that some of the energy extracted from a body to do some kind of work will not be available to do that work again: i.e., some of it will be lost.

Hermit: Someone who lives in solitude, especially in an ascetic manner for religious or spiritual purpose. Hermits were popular fixtures in Romantic English gardens, and many estate owners hired hermits or found suitable volunteers.

Lord Holland (1773–1840): English politician. In 1809, Lord Byron attacked Holland and his circle in "English Bards and Scotch Reviewers."

"I had a dream . . . ": This is a quote from Lord Byron's "Darkness," written in 1816: the Year Without a Summer. Mount Tambora had erupted in the Dutch East Indies the previous year, casting enough ash into the atmosphere to block out the sun and cause abnormal weather across much of northeast America and northern Europe.

Iterated Algorithm: A procedure that is repeated in order to solve a mathematical problem.

Francis Jeffrey, the *Edinburgh Review:* Edinburgh's oldest literary journal, established in 1802 in the home of its founding editor, Francis Jeffery (1773– 1850). Jeffrey, a staunch opponent of Romanticism, printed numerous critical attacks on Wordsworth and Byron.

Arcadia **Glossary** continued...

Caroline Lamb (1785–1828): Lady Lamb was a British aristocrat and novelist. Though married to politician William Lamb, she embarked on a well- publicized affair with Lord Byron in the spring and summer of 1812. Byron ended the relationship in August of that year, and Lamb suffered a series of emotional breakdowns that led to her ostracization from fashionable society. Nonetheless, each writer continued to influence and appear in the other's work. Lamb's most famous work is the 1816 novel *Glenarvon*. At the time, her writing was widely dismissed as pulp fiction, but after Lamb's death, scholars began to consider her gifted in her own right.

Baron von Gottfried Wilhelm Leibnitz: Leibnitz (1646–1716) was a German philosopher and mathematician who invented differential and integral calculus.

Library of Alexandria: The Alexandrian library and museum were founded and maintained by the long succession of Ptolemies—rulers of Egypt from 323 to 30 BCE (ending with Ptolemy XV, who reigned alongside his mother, Cleopatra). The library housed mainly Greek-language texts, including the work of many famous Greek poets. Its keepers pioneered the division of works into bound books (as opposed to scrolls) and introduced systems of punctuation.

Claude Lorrain (1604–82): French artist and one of the earliest European painters of landscapes. He was famous for scenes containing both urban and pastoral elements.

John Milton (1608–74): Regarded as one of the greatest English poets, Milton is best known for his epic *Paradise Lost* (1667).

Thomas Moore (1779–1852): Irish Romantic poet, friend and biographer of Lord Byron.

Improved Newcomen Steam Pump: The atmospheric engine invented by Thomas Newcomen in 1712 was the first practical device to harness the power of steam to produce mechanical work. While working at the University of Glasgow in 1763, Scottish inventor James Watt was asked to repair the school's Newcomen Pump. He realized the design wasted a great deal of energy by repeatedly cooling and reheating the cylinder; by 1776, he had improved upon Newcomen's design with a steam engine of his own.

Picturesque Style: By the third quarter of the eighteenth century, the picturesque style of landscape design (which involved imitating paintings, especially those of Claude Lorrain) had established itself as a standard of beauty. It was characterized by its emphasis on disorderliness and roughness: open and irregular views, meandering streams, and rambling wooded hills were complemented by artfully scattered Classical or Gothic temples, bridges, follies, and ruins.

Quantum: Quantum mechanics drives modern physics. Quantum theory is based on the supposition that energy and other physical properties exist in tiny, discrete particles.

Ann Radcliffe (1764–1823): Radcliffe was an English novelist who enjoyed popularity in the 1790s. Her work employs the vivid descriptions typical of the Romantic period and pioneers many characteristics of the Gothic novel, most notably supernaturalism. Her *The Mysteries of Udolpho* (1794) is often cited as the quintessential Gothic novel.

Regency Style (1795–1820): Type of decorative arts produced during the regency of George IV and inspired primarily by Greek and Roman antiquity, with motifs borrowed from traditional Egyptian and Chinese design. Clothing during this period was increasingly simple and utilitarian.

Relativity: The theory of relativity was introduced by Albert Einstein in 1905. It states that the speed of light remains constant for all observers regardless of the observer's motion or of the source of light. Although the Newtonian laws explain most physical phenomena, they are insufficient at speeds approaching the speed of light—the maximum speed possible, according to the theory of relativity. Other aspects of the theory: mass and energy are equivalent and convertible; objects and time transform with motion.

Romantic: The Romantic movement in European art occurred between 1800 and 1850. Romantic art gives increased attention to the elements of nature that suggest power, struggle, fear, anguish, horror, frustration, and other intense emotions.

Salvator Rosa (1615–73): Rosa was a noted Italian Baroque painter known for his Romantic landscape paintings, which supposedly inspired the picturesque movement in English landscape design.

Sir Walter Scott (1771–1832): Scottish writer, poet, and historical novelist.

"She Walks in Beauty": Among Lord Byron's most famous poems, "She Walks in Beauty" appears in *Hebrew Melodies* (1815). The first stanza reads, "She walks in beauty, like the night / Of cloudless climes and starry skies; /And all that's best of dark and bright / Meet in her aspect and her eyes: / Thus mellow'd to that tender light / Which heaven to gaudy day denies."

William Thackeray (1811–63): Thackeray was an English journalist, novelist, and contemporary of Charles Dickens. Famous for his satirical works, particularly the novel *Vanity Fair*, he was also the first editor of the *Cornhill Magazine.*

"The barge she sat in, like a burnished throne . . . ": This is a quotation from Act II, Scene 2 of Shakespeare's *Antony and Cleopatra.*

The Close Season: In hunting and fishing, the close season refers to the period of the year when killing certain game is prohibited.

Horace Walpole (1717–97): An English historian, member of Parliament, playwright, and novelist, Walpole wrote *The Castle of Otranto* (1764), often called the first Gothic novel, and penned the influential essay "On Modern Gardening" (1780), which called for a more progressive and natural approach to garden design.

William Wordsworth (1770–1850): British poet who, with Coleridge, helped establish Romanticism in England. He wrote *Lyrical Ballads* in 1798 with Coleridge, and in 1843 he was named poet laureate.

This glossary edited by Dan Rubin first appeared in American Conservatory Theater's performance guide series, Words on Plays, in 2013. For more information about Words on Plays, visit www.act-sf.org/wordsonplays.

Resources and Suggestions for Further Reading

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About **A Noise Within**

A NOISE WITHIN A Noise Within produces classic theatre as an essential means to enrich our community by embracing universal human experiences, expanding personal awareness, and challenging individual perspectives. Our company of resident and guest artists performing in rotating repertory immerses student and general audiences in timeless, epic stories in an intimate setting.

Our most successful art asks our community to question beliefs, focus on relationships, and develop self-awareness. Southern California audiences of all ages and backgrounds build community together while engaging with this most visceral and primal of storytelling techniques. ANW's production of classic theatre includes all plays we believe will be part of our cultural legacy. We interpret these stories through the work of a professional resident company—a group of artists whose work is critical to their community—based on the belief that trust among artists and between artists and audience can only be built through an honest and continuing dialogue. Our plays will be performed in rotating repertory, sometimes simultaneously in multiple spaces, and buttressed by meaningful supporting programs to create a symphonic theatrical experience for artists and audience.

In its 25 year history, A Noise Within has garnered over 500 awards and commendations, including the Los Angeles Drama Critics' Circle's revered Polly Warfield Award for Excellence and the coveted Margaret Hartford Award for Sustained Excellence.

More than 40,000 individuals attend productions at a Noise Within annually. In addition, the theatre draws over 15,000 student participants to its arts education program, *Classics Live!* Students benefit from in-classroom workshops, conservatory training, subsidized tickets to matinee and evening performances, post-performance discussions with artists, and free standards-based study guides. ♦

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