Photograph 51

INTRODUCTION

BRIEF BIOGRAPHY OF ANNA ZIEGLER

Born in New York and educated at several prestigious institutions—including Saint Ann's School in Brooklyn, Yale University, the University of East Anglia, and New York University—Anna Ziegler studied and honed her craft for years before her breakout play, *Photograph 51*, premiered in 2015 in London's West End to rave reviews. The production, starring Nicole Kidman in her first theatrical role in decades, catapulted Ziegler to worldwide renown. *Photograph 51* won London's 2016 WhatsOnStage award for Best New Play and was heralded by news outlets including *The Washington Post* and *The Telegraph* as one of the best plays of the year. Since then, Ziegler's work has been presented at The Williamstown Theatre Festival, The Manhattan Theatre Club, The Geffen Playhouse, and The Roundabout Theatre Company, to name just a few of the theaters both experimental and established that have commissioned Ziegler's work. Four of her best-known works are collected in *Anna Ziegler: Plays One*, an anthology available from Oberon Books.

HISTORICAL CONTEXT

Because the play is a piece of historical fiction, the events it depicts took place in real life. Though Anna Ziegler takes theatrical liberties in recreating the thoughts, speech, and feelings of her characters, their relationships to one another and the professional trials and moral quandaries they face over the course of the action are all rooted in reality. In 1950, Rosalind Franklin was awarded a research fellowship at King's College, and in 1951 began her work there alongside Maurice Wilkins and Raymond Gosling, who had already produced some diffraction images of DNA. Franklin's expertise allowed the three to uncover, over the course of several years, the double-helix structure of DNA while the team of James Watson and Francis Crick worked on the same problem at Cambridge. Wilkins's frustration with Rosalind's methods and demeanor led him to share their team's research with the Cambridge team, and soon, Watson and Crick completed a model of the structure of DNA and published their findings in April of 1953—acknowledging Franklin's pivotal research merely in a short footnote at the bottom of their article. Discounted and betrayed by her male colleagues, Franklin left King's for Birkbeck College that same year, where she researched RNA and polio until her death in 1958.

RELATED LITERARY WORKS

Photograph 51 joins a rich tradition of biographical theater pieces which reimagine the lives, thoughts, and actions of historical figures both prominent and obscure. Stretching back to the plays of Shakespeare, who wrote history plays including *King John*, *Julius Caesar*, and the Henriad, audiences have long had a fascination with dramas that uncover and enrich the lives of real individuals. More modern biographical dramas include George Bernard Shaw's *Saint Joan*, about the life, death, and canonization of Joan of Arc; Bernard Pomerance's *The Elephant Man*, about the life of the Proteus syndrome-afflicted Joseph Merrick; comedian and actor Steve Martin's *Picasso at the Lapin Agile*, a fanciful comedy about an imagined meeting between Pablo Picasso and Albert Einstein; and the hit Broadway musical *Hamilton*. This wide range of plays illustrates the possibilities of historical drama: plays about real individuals can hew closely to real-life events, drawing tension, conflict, and intrigue from the simple facts of history. They can also bend the shape of time, circumstance, and character, using theatrical devices and colliding forms to draw parallels between the lessons of history and the trials of the present moment.

KEY FACTS

- **Full Title:** Photograph 51
- **When Written:** 2010s
- **Literary Period:** Contemporary
- **Genre:** History Play
- **Setting:** Primarily London and Cambridge, England
- **Climax:** Rosalind Franklin realizes that she has ovarian cancer as Wilkins arrives in Cambridge to view the model of DNA's structure which Watson and Crick have just finished.
- **Antagonist:** Maurice Wilkins, James Watson, Francis Crick, Time
- **Point of View:** Dramatic

EXTRA CREDIT

Touching Tribute. Nicole Kidman, the famous and award-winning actress who performed the role of Rosalind Franklin during *Photograph 51*'s London run, dedicated the role to her father Antony Kidman—an Australian biochemist who studied, worked, and taught around the world. The play's final preview performance took place a year to the day following Kidman's father's death, and, at the end of it, Kidman gave a speech in which she stated that inhabiting the role of Rosalind Franklin was her way of "acknowledging the people in science who quietly do things and aren't acknowledged a lot of the time." Kidman went on to receive high accolades for her performance: she was nominated for Best Actress at the 2016 Olivier

Awards, and won Best Actress at the WhatsOnStage Awards, the Evening Standard Theatre Awards, and was presented with the Theatre Icon Award at the 2015 *Harper's Bazaar* Women of the Year gala.

PLOT SUMMARY

Rosalind Franklin and several of her colleagues and rivals step forward onto the stage to deliver, in a mix of choral address and rapidly shifting scene-setting, the story of the "race" to discover the structure of DNA in 1950s London. In January of 1951, X-ray crystallographer Rosalind Franklin—a Jewish British scientist in her mid-30s—arrives back in London after several years in Paris to work as a researcher at King's College. Rosalind, however, is greeted with a rude awakening as she's introduced to her colleague Maurice Wilkins—she has been brought to King's to effectively serve as Maurice's assistant as he works to uncover the structure of DNA. Rosalind is irate even as Wilkins urges her to think of their arrangement as a "partnership."

As Rosalind and Wilkins begin working together, it becomes clear that there are many differences between them—personally, professionally, and ideologically. Wilkins refuses to take Rosalind seriously, and refers to her as "Rosy" or "Miss Franklin," ignoring her title of "Doctor." Rosalind's research assistant, a graduate student named Ray Gosling, repeatedly attempts to diffuse the tensions between the two, but as Wilkins' insults pile up, Rosalind is more and more resistant to his repeated attempts to apologize for his own verbal and behavior bungles and "begin again" on the right foot when it comes to their partnership. Rosalind and Wilkins occasionally have friendly conversations, such as when they discuss a production of **The Winter's Tale** taking place in the West End, but ultimately Wilkins always manages to wind up leaving Rosalind feeling exploited and disrespected. Rosalind begins working in her own section of the laboratory and takes up a correspondence with an American PhD student in biophysics, Don Caspar, another Jewish person trying to make his way in a difficult field. As Rosalind and Gosling continue taking X-ray photographs of DNA crystals, Gosling tries to warn Rosalind to be careful around the machine, but Rosalind ignores his remarks and frequently steps directly into the X-ray beam.

After delivering a lecture on DNA at a conference in Naples, Wilkins is approached by a brash, cheerful young American scientist named James Watson. Watson asks to come study crystallography at King's and help Wilkins win the "race" to discover the structure of DNA—but Wilkins insists there is no race. Watson approaches another scientist, a Cambridge researcher named Francis Crick, and the two begin working together relentlessly to make a model of DNA's structure. As Wilkins returns to King's College, having realized that other scientists are also trying to unlock the secret of DNA, he encourages Gosling and Rosalind to double down.

As Wilkins continues delivering lectures around Europe, Rosalind realizes he's presenting the research they've done together as his own and becomes incensed. Tensions in the laboratory increase as Rosalind refuses to collaborate with—or even really speak to—Wilkins any longer. As Wilkins grows more and more frustrated with Rosalind's coldness, he visits Crick and Watson at Cambridge and vents to them about how hard it is to work with her. Crick and Watson gleefully join Wilkins—in Cambridge and, later, at Rosalind's own lectures in London—in making fun of Rosalind. When Crick and Watson cross a line, however, and hastily cobble together elements of Rosalind's research to finish a poorly rendered, incorrect model, Wilkins grows suspicious of their methods. Back in London, Rosalind and Gosling develop a photograph they've recently taken with their X-ray camera and stare at the strange new image. They are looking at **Photograph 51**—the 51st image they've developed, and the first one that clearly shows a helical structure to DNA. Gosling is excited by the breakthrough, but Rosalind, who doesn't believe in hastily publishing one's results, insists on letting the image sit a while in her desk drawer before writing about it or presenting it to anyone—even Wilkins. Rosalind knows that as a female scientist—and a Jewish one—she "must never be wrong." Later that night, Gosling takes the photo from Rosalind's desk and delivers it to Wilkins, believing the man deserves to see the findings.

In January of 1953, Watson visits the lab at King's College hoping to convince Rosalind to collaborate with him and Crick in the "race" they're all running. Rosalind refuses, and Watson heads down the hall to visit Wilkins. Watson tells Wilkins that he deserves to work with collaborators who actually want to get along, work together, and publish their findings. Wilkins agrees and shows Watson Photograph 51, which he's been puzzling over all morning. Watson, realizing what the photograph shows, rushes back to Cambridge where he and Crick begin developing a new model—a model they know will change their lives, and perhaps the entire world.

Don Caspar arrives at King's to work alongside Rosalind, and Caspar is clearly attracted to her. Meanwhile, Wilkins visits Crick and Watson, and the two of them ask him if he'd be opposed to their trying to build another model—conveniently leaving out the fact that they've already started working on it. Wilkins says that if he'd known they were going to take another crack at a model, he wouldn't have shown them Photograph 51. Nonetheless, they continue with their work. In February, Crick and Watson host Wilkins, Caspar, and Rosalind at Cambridge. Watson and Crick try to discern whether Rosalind is at work on her own model, but she does not volunteer any information.

Back in London, Rosalind continues her work—she grows exhausted, but she refuses to ask Wilkins for any help.

Meanwhile, Watson and Crick, who are working together, complete their model. Rosalind falls ill one night at dinner with Caspar and subsequently learns that she has two large cancerous tumors—one in each ovary. Watson and Crick publish their findings—Watson is thrilled, but Crick admits that the prospect of fame is too much for him. Rosalind leaves the hospital and returns to the laboratory, determined to continue working. Wilkins tells her about Watson and Crick's model and laments that he and Rosalind have lost the race, but Rosalind insists the opposite is true: the whole world, she says, has won. Rosalind laments that if she'd had more time, she might have been able to see what was right in front of her all along. Her self-pity leads her to question several other circumstances of her life, both within and beyond her control—but pulls herself out of her sadness and begins looking forward to continuing her work and attending a conference in Leeds the following month.

Before Rosalind can go to Leeds, however, she succumbs to her ovarian cancer and dies. The narrative of the play fractures as Wilkins steps forward out of the action and demands the whole thing "begin again." He and Rosalind connect, suspended out of time and space, and Wilkins apologizes for not trying to meet Rosalind halfway. She, too, apologizes for her failure to collaborate with him. Rosalind and Wilkins share a sad, profound moment as they try to remember the name of the actress whose performance Rosalind loved in *The Winter's Tale*—but can't come up with anything and resign themselves to the notion that "she simply didn't stand out."

CHARACTERS

Rosalind Franklin – The protagonist and central figure of *Photograph 51*, Rosalind Franklin is a brilliant Jewish British scientist in her mid-30s who has returned to England after several years abroad in Paris to work in the X-ray crystallography lab at King's College London. Rosalind receives a rude awakening upon arriving, however. She's been brought to King's under false pretenses—she is meant to be Maurice Wilkins's assistant, a role she refuses to take on principle. Rosalind, wearied, jaded, and toughened after facing years and years of sexism and antisemitism in the science community (in spite of her equal or superior qualifications to those of her male colleagues) is completely committed to the practice of working, researching, and studying her results alone—a practice that offends and confounds Wilkins as well as Rosalind's own research assistant Ray Gosling. Rosalind is serious, intense, and aloof—traits that Rosalind likely practiced and calculated over the years to protect herself from the disappointments and indignities that come with being a woman in science. At the start of the play, Rosalind stands on the precipice of a great scientific discovery. And although she and Gosling ultimately produce an image, **Photograph 51**, that hints at the much-sought-after answer to the structure of DNA, Rosalind's cautious research practices keep her from sharing her findings with her colleagues. When Gosling gives Photo 51 to Wilkins—who, in turn, shows it to the American scientist James Watson—Rosalind's solitary methods backfire. Watson and his research partner Francis Crick hurry to develop a model together, and their research outpaces Rosalind's. Then, when Rosalind is diagnosed with ovarian cancer and hospitalized, Watson and Crick "discover the secret of life" and publish their findings, winning the Nobel Prize along with Wilkins. At the end of the play, Rosalind acknowledges that while certain obstacles—from societal prejudice to her own prickly personality—got in her way, she never wavered in her devotion to her work. A self-reliant woman dedicated to benefiting humanity through her research, Rosalind Franklin is a complex character who comes to find that the walls she's built to protect herself and her work also, unfortunately, hinder her.

Maurice Wilkins – A British physicist at King's College. Lauded, established, and taken seriously by his colleagues in the community, Wilkins brings Rosalind Franklin to King's College to assist him—not realizing that the woman he cruelly refers to as "Rosy" and "Miss Franklin" is determined to assist no one and to instead focus intensely on her own research. Wilkins is Rosalind's foil and rival, but in spite of his occasionally thoughtless treatment of her and his occasionally sexist or antisemitic words toward her, there is a part of him that really wants to get through to her, win her trust, and build a sustainable professional working relationship. Wilkins is constantly trying to "begin again" with Rosalind and prove to her that he can be a good friend and colleague—but at a certain point, he realizes that it is too late to begin again, and that his relationship with Rosalind will never be anything other than the contentious, adversarial one it is. Wilkins, frustrated with Rosalind's aloofness and her resistance to turning over a new leaf with him, turns to the Cambridge team of Watson and Crick for friendship and professional support. Wilkins shares with Watson and Crick important parts of Rosalind's painstaking research, including the infamous **Photograph 51**, unaware that the two men are racing against the clock to develop their own model of DNA's structure—a structure that Photo 51 reveals. In spite of his relentless attempts to connect with and ingratiate himself to others in his community, Wilkins privately admits his belief that science is "the loneliest pursuit in the world." Beyond his old-guard chauvinism and his desire, seemingly, to maintain the status quos in both science and society, Wilkins does eventually express remorse for the callousness he showed Rosalind, openly regretting that he, too, failed to collaborate or support her as her research partner.

Ray Gosling – A graduate student at King's College assigned to assist Rosalind Franklin with her research in X-ray crystallography, and the man who eventually helped her to capture and develop **Photograph 51**. Portrayed in the play as

earnest, helpful, and eager to please, Gosling is often the first character to step outwards from the action of the play to offer commentary on the events being portrayed. Rather than appearing as a know-it-all, however, Gosling's comments on the events of Rosalind Franklin's life and career are meant to bring to light the parts of Rosalind's story that have often gone overlooked. In this respect, Gosling assists Rosalind in death just as he did in life—by lifting up her voice and her work—and attempts to atone for the mistakes he made in sharing her work without her permission. Gosling is rattled by Rosalind's cancer diagnosis, knowing that his repeated warnings to her to avoid the beams of their X-ray machine during her research went ignored time and time again. Despite his youth, Gosling is intelligent, warm, and focused intensely on the values of collaboration and openness in his workplace. He represents hope for the future of the scientific profession and the scientific community more largely.

Don Caspar – An American scientist who becomes fascinated by Rosalind Franklin's research—and, over the course of their ongoing written correspondence, besotted with Rosalind herself—then later travels to King's College to assist and study with her. Caspar is Jewish, like Rosalind, and the two of them bond over being the only two Jewish people in the entire college. Caspar is attracted to Rosalind because of her intelligence—rather than being intimidated by her and attempting to cut her down to size, like her male colleagues at King's and Cambridge do, Caspar attempts to let Rosalind know just how special she is and how vital not just her research but her mere presence in the scientific profession truly is. Throughout the play, Caspar is often quick to jump to Rosalind's defense when other scientists are making fun of or speaking badly about her and is perhaps the only character whose genuine kindness promises to pull Rosalind out of her shell. Their relationship is nipped in the bud when Rosalind is diagnosed with ovarian cancer, and Caspar laments that their friendship never developed into anything more. Warm, genial, and profoundly kind, Caspar seems to understand and respect Rosalind on a level none of her colleagues even attempt.

James Watson – A young, confident, brash American scientist working as a researcher at Cambridge University. Watson's dreams of renown and fame—and his intense desire to prove himself to the world—spur him to build model after model and develop theory after theory as he runs the "race" towards the discovery of DNA's structure. Watson approaches Maurice Wilkins after a conference in Italy and asks to come work with him, but when Wilkins rejects Watson, he joins a research team at Cambridge instead. The older but demurer Francis Crick becomes his research partner, and Watson sees the two of them together as a force of nature capable not just of winning the "race" Watson believes they're in, but changing the world entirely. Watson is shameless in his desire to win, and even preys upon Maurice Wilkins' good-faith gesture of sharing **Photograph 51** with him. While Watson and Crick credit Wilkins with helping them to discover the structure of DNA and enabling them to at last build a correct model, they underplay and overlook Rosalind Franklin's role in their discovery. Watson is vocally critical of and cruel toward Rosalind, making fun of her demeanor and physique in sexist, antisemitic terms throughout the action. A self-absorbed, chaotic, and unpredictable young man, Watson provides much of the comic relief in the play—even amid his cruel treatment of Rosalind, his shameless competitiveness, and his self-aggrandizement.

Francis Crick – James Watson's research partner at Cambridge University. Where Watson is ambitious and "hungry," Crick is slightly more proper and reserved. He dreams of success but not fame, professional satisfaction but not sensational international renown. His unhappy marriage is a source of strife in his life, and though he tries to maintain a work-life balance, the play suggests that Crick's willingness to be pulled into Watson's chaotic orbit and seduced by the man's dreams of glory negatively impact the other aspects of Crick's life. Crick and Watson are an unlikely pair, but the play shows how Crick's open, trusting personality makes him the perfect partner to Watson, whose intense personality, unsavory research methods, and laser-focused desire to prove himself to the world eventually rub off on Crick. Ultimately, Crick is forced to confront the ways in which his association with Watson has derailed his own dreams of making a "small difference" in the world and living a quiet, respectable life.

THEMES

In LitCharts literature guides, each theme gets its own color-coded icon. These icons make it easy to track where the themes occur most prominently throughout the work. If you don't have a color printer, you can still use the icons to track themes in black and white.

SEXISM AND ANTISEMITISM

Photograph 51 centers on Rosalind Franklin, a 20th-century scientist whose infamous "**Photograph 51**" (an X-ray image of crystallized DNA) was crucial in discovering DNA's double-helix structure. Throughout the play, Rosalind (who's female and Jewish) works in a lab at King's College London as a male scientist's research assistant, and her white male colleagues treat her with relentless sexism and antisemitism that prevent her from being taken seriously in her career. As such, the play highlights just how common these discriminatory attitudes were in the 1950s and suggests that sexism and antisemitism derailed Rosalind Franklin's career.

Throughout the play, Rosalind's colleague Maurice Wilkins undermines and belittles her because she's a woman. For

instance, even though Wilkins insists on being called Dr. Wilkins in the lab, he calls Rosalind "Miss Franklin"—undermining the fact that she has the same qualifications he does, having earned her doctorate from the University of Cambridge. While Wilkins possibly believes that he's being polite by calling Rosalind "Miss Franklin," his decision to ignore her professional title highlights the fact that he sees her as inferior to him simply because she's a woman. Wilkins later nicknames her "Rosy"—a patronizing name that he uses to invalidate Rosalind's personality. By making fun of how un-"rosy" she is, he implies that he has certain expectations of how women should behave, and he's determined to belittle "Rosy" until she acts the way he expects her to. Wilkins begins to refer to Rosalind as "Rosy" behind her back as he buddies up with two other male scientists, Francis Crick and James Watson, exploiting his professional relationship with Rosalind to get closer to them. The men delight in privately denigrating "Rosy," poking fun at her serious demeanor as Watson and Crick plot to profit off her hard work. The men's disrespectful treatment of Rosalind more broadly speaks to how female professionals in the 20th century were often undermined and taken advantage of.

There are also several instances when Rosalind is overtly discriminated against and excluded because of her gender. Firstly, Rosalind isn't allowed to eat in the senior lunchroom with Wilkins, which prevents her from forming meaningful relationships with her colleagues—and from participating in the important conversations that take place over lunch. "Scientists make discoveries over lunch," says Rosalind. She knows that in being barred from the lunchroom, she's not just missing out on the social component work—she's missing out on the chance to engage in serious discourse with likeminded colleagues, simply because she's a woman. Furthermore, Rosalind knows that opportunities for female scientists in the 1950s are few and far between—and she remembers that during World War II, they were even scarcer. The play implies that Rosalind suffers through being excluded, underestimated, and disrespected because she knows that refusing to put up with these things would effectively mean the end of her career.

Rosalind faces antisemitism in the laboratory as well, as her religious identity signals her as "other" to her colleagues. When Rosalind remarks that she disapproves of Wilkins's work on the Manhattan Project (the U.S.'s nuclear bomb development during World War II), Wilkins suggests "without apology" that the world—Jewish people especially—should be "grateful" for the fact that nuclear warfare "save[d]" them. Though not overtly antisemitic, the way Wilkins phrases this comment makes it sound like he's lumping all Jewish people, including Rosalind, together. He sees Jewish people as other, and he callously remarks that Jewish people should be more "grateful" to have been rescued from the German Nazi regime in World War II—seemingly not realizing (or not caring) that his comment might make Rosalind uncomfortable. Later on, Watson uses antisemitic tropes of Jewish people as "ornery" and power-hungry while talking with Wilkins and Crick about how much he dislikes Rosalind. Watson specifically invokes the antisemitic stereotype that Jewish women are unfeminine and demanding, asking if Rosalind is "the kind of woman who barrels over you with the force of a train." Wilkins doesn't stick up for Rosalind, failing to defend her when other men in their profession denigrate her, and thereby demonstrating his own complicity in sexism and antisemitism. The frequency and casual nature of sexist and antisemitic treatment in the play suggest that these two toxic forces were commonplace in 1950s society; Rosalind Franklin's struggles speak more generally to how women and minorities were mistreated at this time. Rosalind is taken advantage of because, as a woman and a Jewish person, she exists in the margins of wider society—and within her own male-dominated profession, she's even more of a target for prejudice.

"I don't like others to analyze my data, my work. I work best when I work alone," says Rosalind at the start of her work alongside Wilkins. It's not that she doesn't trust her research partner—it's that she's developed methods for "work[ing] alone" out of necessity, because the sexist and antisemitic society in which she lives is prejudiced against her. Though Wilkins bristles at Rosalind's prickly nature at first, over the course of the play, his and his fellow colleagues' actions confirm her suspicions: women, especially Jewish women, are not treated as equals at King's College.

PERSONAL VALUES VS. PROFESSIONAL SUCCESS

Throughout *Photograph 51*, scientific research partners Rosalind Franklin and Maurice Wilkins have very different relationships to success and professional fulfillment. Rosalind, a Jewish woman, has spent the majority of her career in a male-dominated field knowing that unless her work is perfect, it will likely be dismissed. As a result, she's motivated by a genuine love of her work and the ways it could benefit humanity—not the accolades she may or may not receive for it. On the other hand, Wilkins and his contemporaries Francis Crick and James Watson are more ambitious and eager to succeed, even if that means compromising their morals to do so. In the "race" to solve the structure of DNA, the scientists' different priorities clash. And although Rosalind loses out on success and recognition in the end, the play suggests that the way a person conducts themselves and treats others is more important than achieving professional acclaim.

Rosalind and Don Caspar are primarily concerned with maintaining their personal values and genuine interest in their work—not with glory or admiration. Rosalind, a lifelong nature-lover, takes pleasure in her work because it allows her to

explore the beautiful shapes that comprise the smallest parts of life: the proteins and molecules that make up all living creatures. In her research position at King's College, however, she finds herself in a cutthroat work environment where her colleagues are always trying to get ahead. Rosalind, as a Jewish woman, knows that sexism and antisemitism will derail any path to personal glory she pursues—and so she chooses to focus on the work in front of her rather than any success that work could potentially bring. She finds a likeminded counterpart in Don Caspar, an American graduate student who begins writing to her to request research materials that will further his doctoral thesis. (Rosalind is "the world's expert" on the chemical makeup of coal molecules, the subject of Caspar's project.) Though Rosalind is standoffish at first—since she's aware that the men in her field often have ulterior motives for collaborating with others—she soon sees that Caspar, like her, is genuinely invested in the beauty of his research. Though Rosalind and Caspar don't end up receiving the glory that their more bullish colleagues do, they have a genuine respect for each other's careful, "groundbreaking" work—and for each other's passion for that work, "even before [it] mean[s] something." And this personal fulfillment, the play implies, is more meaningful than any professional accolade.

Wilkins, Crick, and Watson, on the other hand, prioritize professional success above all else—an approach that Wilkins lives to regret. Though Wilkins at first asserts that "there is no race" to find the structure of DNA, he nonetheless finds himself swept up in Crick and Watson's breakneck attempts to win the "race." Wilkins grows frustrated by Rosalind and Caspar's careful approach to their work. And while he doesn't approve of the slipshod models of DNA that Crick and Watson turn out in hopes of merely reaching the finish line first, he finds himself yearning for recognition. At lectures and conferences, he presents the work he and Rosalind are doing together as his work alone, leading Rosalind to accuse him of "self-aggrandizement at the cost of […] integrity." This offends Wilkins even more, pushing him closer to Watson and Crick—and he unintentionally shares valuable research of his and Rosalind's with the pair, which allows them to hastily build an accurate model of DNA's structure. They, along with Wilkins, win the Nobel Prize for the discovery, essentially cutting Rosalind out for the sake of a prestigious award. Wilkins, however, ends the play feeling remorseful about excluding Rosalind, and he's unable to see the larger picture she does: that "the world won." In other words, just because Rosalind didn't receive due credit for her work, her and Wilkins's DNA research will nevertheless lead to new developments in medical and genetic research and thereby benefit humanity. But in the end, Wilkins doesn't get to enjoy the fact that his name ended up on the Nobel beside Crick's and Watson's. Unlike Rosalind, he compromised his values and betrayed his research partner—and as a result, he's "spent [his] whole life in regret."

At the end of *Photograph 51*, Rosalind suggests that because the answer to the "secret of life" found its way into the world, her and Wilkins's work was successful—even though they weren't the ones to share that secret with the world first. It doesn't matter to Rosalind that she won't get the glory of the Nobel Prize; for her, "the work never ends." That the play ends on this note suggests that Rosalind's work wasn't in vain—and that personal values like work ethic, professional integrity, and serving the common good are more important than professional success or glory.

CHOICES AND ACTIONS VS. CHANCE AND FATE

Photograph 51 focuses on a crucial moment in scientist Rosalind Franklin's career, when she and her lab assistant Ray Gosling take an X-ray image ("**Photograph 51**") that holds the key to the structure of DNA. The monumental discovery has the potential to change the world by introducing humanity to the "secret of life." But Rosalind decides to keep her findings private until she can be certain of what they mean, illustrating her belief in the value of human choice and action over the idea that things are fated to happen at certain moments. Her colleagues James Watson and Francis Crick, however, think that a combination of fate and luck made the discovery happen—and that they were destined to cross paths with Rosalind in order to use her work to their own advantage. Over the course of the play, their belief in chance and fate clash with Rosalind's staunch faith in free will. Ultimately, however, the play suggests that both decisive action and chance play equally important roles in people's lives, affecting not only individuals but even the course of history in unpredictable ways.

First, the play explores the possibility that fate has the power to change the course not just of an individual life, but of many lives. "Didn't she feel that something was at her back, a force greater than she was[?]" asks Francis Crick. (He and James Watson are commenting on the play's action from an unidentifiable time and place.) "You mean us?" Watson asks. "No. I mean fate," Crick answers. "What's the difference?" Watson intones. This exchange suggests that the seemingly random encounters that bring people together and put people on similar or parallel paths may actually be the workings of fate. Specifically, they're implying that fate is what allowed the two of them to cross paths with Rosalind and Wilkins, enabling them to take credit for Rosalind's discovery of the structure of DNA and win the Nobel Prize along with Wilkins. In Watson and Crick's view, fate ("a force greater than [Rosalind] was"), not any of their own decisions, is what formed the chain of events that led to their ability to profit off of her work.

But toward the end of the play, characters also explore the possibility that choice and action alone are what determine the course of a life. In the final scene, Rosalind muses aloud, "I think

there must come a point in life when you realize you can't begin again. That you've made the decisions you've made and then you live with them or you spend your whole life in regret." She believes that life is defined by actions and choices—not by the intrusion of fate or random chance. When Wilkins asks whether their lives would have turned out differently had they made different choices earlier on in their professional relationship, Rosalind doesn't answer him. Though she doesn't outright agree with him, her silence implies that she's resigned to the fact that the choices people make determine the outcomes of their lives. And, in Rosalind and Wilkins's case, it's too late to "begin again." Rosalind's perspective stands counter to Crick and Watson's earlier suggestion that great, unseen forces steer people's destinies. She believes that a life is the sum of one's choices and actions, and nothing more.

Ultimately, though, the play seems to suggest that neither conscious choice nor the whims of fate and chance solely define the course of a life. Instead, the play allows for the possibility that seemingly random twists of fate actually work in tandem with people's choices and actions. For example, at a 1951 scientific conference in Naples, Wilkins shows Watson (his colleague and rival) the DNA research that he and Rosalind have been working on. After the panel, Watson approaches him. "It's just incredibly exciting," Watson rambles, "To be born at the right time. There's an element of fate to it, don't you think? And I don't believe in fate." This exchange speaks to how fate and chance influence people's lives. Rosalind Franklin and her colleagues were all "born at the right time"—a random occurrence, of course, but nonetheless important in how their lives and careers take shape (even to rational doctors and scientists who "don't believe in fate"). But at the same time, Watson, Crick, Rosalind, and Wilkins all freely chose to become scientists. It's a matter of random chance (or perhaps fate) that they were all born in the same era and that they're now crossing paths professionally, but choice certainly played a role as well. This confluence of free will and fate is what brings the two pairs of scientists together, setting the stage for Wilkins to show Photograph 51 to Watson and Crick, and for Watson and Crick to take credit for Rosalind's research and win the Nobel Prize along with Wilkins. The randomness of chance—and, as Watson suggests, the inevitability of fate—collides with the characters' free will as they try to solve the question of DNA's structure. Their paths cross by chance, but also because of their individual choices. In this way, action and fate *both* play a role in allowing these individuals to change the course of history through their intertwined research.

TIME AND MEMORY

The timeline of *Photograph 51* is fluid: as the play tells scientist Rosalind Franklin's story, it also emphasizes the strange and often confusing nature of time. Characters aren't limited to linear movement through time, as they often comment on their own (and one another's) pasts, presents, and futures. Through its unconventional structure, the play examines how time worked against Rosalind Franklin, cutting her life short and forcing her into a race against the clock to uncover the molecular structure of DNA and thus unlock "the secret of life." But alongside this, the play proposes that memory (both personal memory and collective memories in history or literature) is just as real and important as the events that occur on a linear timeline. In doing so, *Photograph 51* suggests that even though time limits and thwarts people, memory can allow them to take control of time and ensure that their own stories—and the stories of those important to them—live on.

The constraints of time work against the characters of *Photograph 51* in several different ways. Central to the play is the characters' race to discover the structure of DNA. In addition, there's the more existential problem of not having enough time on Earth, which emerges once Rosalind is diagnosed with ovarian cancer (a result of exposing herself to harmful X-ray beams during her research). In these ways, Rosalind Franklin's story speaks to how time restricts, confuses, and controls humanity. "There must come a point in life when you realize you can't begin again. That you've made the decisions you've made and then you live with them or you spend your whole life in regret," says Rosalind to Wilkins at the end of the play. Having been diagnosed with cancer, time has felled Rosalind, and she knows it. Time has cut her life short and prevented her from completing the work she wanted to. Had she been born in a different era or given more time while she lived, history might have remembered her very differently. But time is beyond human influence or understanding—it's an uncontrollable force that constrains people, dictating what they can and can't do in the course of their lives.

Toward the end of the play, Rosalind is forced to contend with the cruel, unfair nature of the passage of time. "I suspect you didn't allow yourself to see it," Wilkins says of the fact that, while Rosalind was the first person to **photograph** the structure of DNA, Watson and Crick used her research to model it before she could understand the very material she'd created. "No," Rosalind replies melancholically, "but with a little more time, I like to think I would have [...] So then why didn't I get those days? [...] Didn't I deserve them?" In this passage, Rosalind laments how time has shortchanged her. The idea that some "deserve" more time—and that she was not one of the lucky ones—devastates Rosalind. In this way, the play externalizes the grief that Rosalind must have felt toward the end of her life over having been outfoxed by her colleagues and struck down by a disease that rapidly deteriorated her body. Indeed, time itself was unfair to Rosalind Franklin.

Time was Rosalind's enemy, cutting her life too short—but the play, as a kind of living memory, allows Rosalind to step outside of time and thus reclaim it. "It's the tricky thing about time, and

memory [...] Whole worlds of things we wish had happened are as real in our heads as what actually did occur," says Don Caspar in response to Wilkins. Wilkins doesn't want to accept that Rosalind's time ran out—but Caspar suggests that while time is humanity's enemy, people can live on in the memories of those who knew them. Remembering and even reimagining a person's life is "as real in our head as what actually did occur." And indeed, the play itself gives Rosalind a different *kind* of time, if not more of it—a whole span of theatrical time devoted to her story, personal time to reflect on her successes and mistakes, and the time and attention of the very colleagues who overlooked or preyed upon her work when she lived. Thus, though time is fickle and fluid in the world of *Photograph 51*, the play ultimately offers its characters—and by extension, their real-life counterparts—a bittersweet way of reclaiming time.

SYMBOLS

Symbols appear in **teal text** throughout the Summary and Analysis sections of this LitChart.

PHOTOGRAPH 51

Photograph 51—an image that, for the first time in history, showed the molecular structure of DNA—represents the wide gulf between personal values and professional aspirations that developed over the course of Rosalind Franklin and Maurice Wilkins's partnership. The central and titular symbol within the play, Photograph 51 is a real-life X-ray diffraction image of crystallized DNA taken by Ray Gosling, Rosalind Franklin's assistant. The image, blurry and often described as hauntingly beautiful, was the 51st photo Gosling and Franklin had developed together—and the first to hold the key to the shape and structure of DNA's signature double helix. Though Gosling and Franklin pored over the image, Franklin, according to Ziegler's play, found herself at the "end of thought," burnt out from months of research and unable to make anything of the bombshell right in front of her. Gosling, frustrated by Franklin's refusal to show the image to her research partner Maurice Wilkins, slipped Wilkins the image—Wilkins in turn showed it to James Watson, who immediately realized what it showed and began working on a new model of DNA with his research partner Francis Crick.

Rosalind Franklin's notorious unwillingness to collaborate—a defense mechanism she developed after facing years of sexism and antisemitism from her overwhelmingly white male colleagues—was responsible, in Ziegler's estimation, for hindering her from deciphering Photograph 51 in the mad "race" to determine the structure of DNA. Photograph 51, and Rosalind's protectiveness over it, comes to represent her personal values of patience, care, and absolute certitude in her work. Whereas Wilkins, like Watson and Crick, prioritized professional success over personal values, Rosalind needed to make sure that her work was unimpeachable before sharing it with the world.

THE WINTER'S TALE

William Shakespeare's play *The Winter's Tale* symbolizes the way that women's voices and accomplishments have historically been seen as less important than those of their male counterparts. In *Photograph 51*, Rosalind Franklin's attends a performance of *The Winter's Tale* one weekend. (This anecdote seems to be fictional, though it's plausible enough, given that a production of *The Winter's Tale* directed by Peter Brooks was indeed playing in London's West End in 1951.) On Monday, her colleague Maurice Wilkins admits that he nearly attended the same performance but decided at the last minute not to buy a ticket. Wilkins later reveals in an aside that he saw Rosalind ducking into the theater and wanted to follow her inside in hopes of creating at least one experience that he and his reluctant partner could share—but he was too afraid to do so. Rosalind remarks that while the actor who played Leontes, John Gielgud, was wonderful, she cannot remember the actress who played his wife Hermione; the actress simply didn't "stand out."

Rosalind, the play suggests, has come to adopt a kind of internalized misogyny after years of oppression and sexism—she discounts the Hermione actress's performance as being unmemorable, not realizing that her own laborious work in pursuit of uncovering the structure of DNA will soon be overlooked in a similar fashion. On an even deeper level, the central relationship between the king Leontes and his wife, Hermione, whom he murders when he suspects that she is unfaithful—only to pray her back to life again towards the end of the play—represents the uneven and occasionally cruel dynamic between Wilkins and Rosalind. Their contentious relationship leads the frustrated Wilkins to betray Rosalind by showing her research to their Cambridge rivals Crick and Watson—it is only at the end of the play, after Rosalind's death, that Wilkins shows remorse for his actions and begs for Rosalind to come back to life so they can begin their relationship again and anew.

QUOTES

Note: all page numbers for the quotes below refer to the Dramatists Play Service edition of *Photograph 51* published in 2011.

Photograph 51 Quotes

ROSALIND. […] We were so powerful. Our instruments felt like extensions of our own bodies. We could see everything, really see it—except, sometimes, what was right in front of us.

Related Characters: Rosalind Franklin (speaker)

Page Number: 11

Explanation and Analysis

As the play begins, Rosalind Franklin takes the stage in a rare moment of solitude. She describes the events that are about to unfold in loose detail, recalling her days as a researcher at King's College London. As Rosalind describes feeling "powerful," capable, and deeply connected to her instruments and her work, the joy she takes in the process of researching and spending time solving problems becomes apparent.

Towards the end of her speech, however, Rosalind admits—with some regret—that at times, she and her fellow colleagues, for all the "power" their research tools lent them, failed to see the obvious. This passage introduces several of the play's major thematic concerns: the benefits and obstacles inherent in collaborative relationships; the differences between choices, actions, chance, and fate; and the cruel, unrelenting passage of time. Though the audience may be either intimately familiar with Rosalind Franklin's story—or, on the other hand, completely unaware of her life's work and her lasting impact on the scientific community—this passage establishes Rosalind as a self-aware woman who remains troubled and conflicted, even in death, about the course her life ended up taking.

ROSALIND. *(Writing the letter, cold and formal.)* I require an X-ray generating tube. And a camera specially made so that the temperature inside it can be carefully controlled. Otherwise, the solution will change during its exposure, and, Dr. Wilkins, you know as well as I do that that just won't do. Finally, if at all possible, I'd like to know when this order will be placed so that, if need be, I can request a few minor modifications. Yours sincerely, Dr. Rosalind Franklin.

WILKINS. Dear Miss Franklin, you are ever so ... ...cordial.

Related Characters: Maurice Wilkins, Rosalind Franklin (speaker)

Page Number: 12

Explanation and Analysis

As Rosalind Franklin prepares to join the research team in the laboratory at King's College, she writes to the man she believes is to be her equal and colleague, Maurice Wilkins, to frankly and simply let him know the materials she requires and expects. This passage establishes Rosalind's straightforward, intense nature, and the ways in which she has learned to ask directly for what she needs.

Rather than seeing his new colleague's directness as an admirable virtue, Wilkins is disgusted and off-put by Rosalind's letter—all because she is a woman. This passage introduces the thread of sexism that runs through the play, and indeed through all of Wilkins' and Rosalind's future interactions. By patronizingly addressing Rosalind as "Miss Franklin" in his response, Wilkins shows that he's not planning on taking Rosalind's requests seriously—in fact, he's not planning on taking her seriously at all. Wilkins has certain ideas about how women should behave, and Rosalind has already challenged those even before her arrival. This passage foreshadows the tension that will come to define their relationship—and the cruel callousness with which Wilkins will treat Rosalind each time she fails to inhabit his preconceived notions of what femininity looks like.

ROSALIND. Dr. Wilkins, I will not be anyone's assistant. *(Beat.)*

WILKINS. What was that?

ROSALIND. I don't like others to analyze *my* data, *my* work. I work best when I work alone. If, for whatever reason, I am forced into a different situation, I should feel that I came here under false pretenses.

WILKINS. I see… […] Then perhaps we could think of our work together as a kind of partnership. Surely that will suit you?

ROSALIND. I don't suppose it matters whether or not it suits me, does it?

Related Characters: Maurice Wilkins, Rosalind Franklin (speaker)

Page Number: 13

Explanation and Analysis

When Rosalind arrives at King's College, she finds that the rug has been pulled out from under her, so to speak. She believes that she's been brought to London to work as an equal alongside Maurice Wilkins in the study of proteins—but upon her arrival, he informs her that in order to keep up with the worldwide "race" to uncover the

structure and behavior of DNA, the lab's priorities have shifted, and Rosalind will be working *under* him on a project other than the one she believed she'd be pursuing. Rosalind is indignant, to say the least, and expresses her desire to work alone on her own projects. Wilkins condescendingly suggests Rosalind simply reframe her way of thinking and learn to consider him her partner—Rosalind knows that she has no choice about whether or not to accept Wilkins' proposition.

This passage embodies the sexism and condescension which drive a rift between Rosalind and Wilkins from their very first meeting, and it demonstrates the constant struggle the two have to define the boundaries of their work. While Wilkins wants to collaborate, Rosalind wants to work in isolation for reasons he can't begin to comprehend, and his cruel treatment of her only intensifies her resistance to compromising and learning to work together.

ROSALIND. I'll have you know that nuclear force is not something of which I approve.

WILKINS. Then I suppose it's good no one asked you to work on it. […] At any rate, you lot never do seem to approve of it.

ROSALIND. I'm not sure I understand what you're driving at. […]

WILKINS. Just that ... people ... worked hard to ... come up with these ways to save ... well, the Jews, and then all you hear back from them is how they don't approve. It feels a little ...

ROSALIND. You're absolutely right that the Jews should be in a more grateful frame of mind these days.

WILKINS. All right, Rosy.

Related Characters: Maurice Wilkins, Rosalind Franklin (speaker)

Page Number: 14

Explanation and Analysis

In this passage, Wilkins and Rosalind discuss Wilkins's work on the Manhattan Project, the U.S.'s nuclear weapons development project during World War II. Wilkins doesn't understand why "the Jews" aren't more grateful for the work that led to their liberation—work that he was a part of. Wilkins might think that because he contributed to the project that ultimately led to the end of World War II (and of the genocidal Nazi Regime in Germany), he is incapable of saying antisemitic things.

But here, Wilkins seems to believe (at least to some extent) that all Jewish people are the same, as he lumps "the Jews" together. While perhaps unintentional, this way of talking about Jewish people is subtly antisemitic—especially given that Rosalind, whom he's speaking to, is Jewish. And when Rosalind challenges Wilkins on this, he further condescends to her by calling her "Rosy." Even if Wilkins doesn't intend to be sexist or antisemitic, the way he's speaking to Rosalind makes her feel alienated—and it will forever stunt their already-tenuous working relationship.

Wilkins's attitude in this passage also subtly implies that professional accolades are important to him, as he wants people to appreciate the work that he contributed to. Throughout the play, Wilkins and Rosalind are constantly at odds when it comes to their personal values and their professional aspirations. While Wilkins is ambitious and eager to be recognized for his accomplishments, Rosalind is more focused on a genuine love of research and how scientific developments can benefit humanity as a whole. This passage, in which Rosalind disapproves of Wilkins's work on the nuclear bomb for moral reasons, sets up their opposing values and foreshadows an uneasy partnership going forward.

ROSALIND. It's absurd, isn't it? Archaic! […] This business of the senior common room…

GOSLING. I suppose. But ... you can't worry about it. […] It's not like biophysicists have such great conversations at meals anyway. They tend just to talk about the work. They never take a break.

ROSALIND. But those are precisely the conversations I need to have. Scientists make discoveries over lunch.

Related Characters: Ray Gosling, Rosalind Franklin (speaker), Maurice Wilkins

Page Number: 15-16

Explanation and Analysis

On her first day at the laboratory, Rosalind is informed she'll be assigned to a specialty other than the one she believed she'd been brought on to research, condescended to on the basis of her sex and her religion, and, finally, excluded from joining her colleague Maurice Wilkins in the all-male common room for lunch. In this passage, as Rosalind expresses her frustration to her assistant Ray Gosling, Ziegler investigates the ways in which sexism perpetuates itself in the workplace as women are excluded from opportunities for community, collaboration, or

advancement.

This passage also gives insight into Rosalind's unyielding commitment to her work. One of the main reasons why she feels slighted in this instance is because she fears that being unable to socialize and collaborate with her male colleagues means that her research will suffer. Unlike some of her more ambitious male colleagues, Rosalind's primary motivation is a genuine love of her work and an interest in benefitting humanity through her research.

Rosalind's desire to work alone and isolate herself in the laboratory is not a product of coldness or an antisocial disposition—rather, it is a defense mechanism that she's developed in order to prevent herself from feeling helpless and excluded in a cutthroat, sexist environment. Even as Wilkins claims to want Rosalind as a partner and an equal, he excludes her from spaces where the "discoveries" of science actually happen—and this contributes to how she's underestimated and denigrated in their professional circle.

WILKINS. I almost went to see the very same performance. […] Our paths so nearly crossed. *(Beat.)* Was it any good?

ROSALIND. Oh yes. Very.

WILKINS. The great difference, you know, between *The Winter's Tale* and the story on which it's based—*Pandosto*—is that in Shakespeare's version the heroine survives.

ROSALIND. John Gielgud played Leontes. He really was very good. Very lifelike. Very good. When Hermione died, even though it was his fault, I felt for him. I truly did.

WILKINS. And who played Hermione?

ROSALIND. I don't remember. She didn't stand out, I suppose.

Related Characters: Maurice Wilkins, Rosalind Franklin (speaker)

Related Symbols:

Page Number: 18

Explanation and Analysis

In this passage, Rosalind and Wilkins have one of their rare friendly conversations as they discuss their respective weekends. As Rosalind tells Wilkins about attending a production of *The Winter's Tale* in the West End, one of the play's central symbols emerges. The parallels between Shakespeare's classic play and the storyline of *Photograph 51* emerge, and the former play takes on a great metaphoric significance throughout the latter.

In *The Winter's Tale*, the jealous Leontes kills his wife, Hermione, when he suspects her of infidelity, only to later bring her back from the dead when he realizes the error of his ways and is overcome by regret. This storyline parallels Wilkins's mistreatment of Rosalind, as well as his contrite desire to "begin again" only after her death. The second major way in which this particular production of *The Winter's Tale* parallels the story of Rosalind's life is Rosalind's own inability to recall the name of the actress who played Hermione. The actress fades into obscurity while her male counterpart delivers an indelible performance—much as Wilkins, Watson, and Crick would subsume Rosalind Franklin in history's collective memory in spite of the fact that they preyed upon Rosalind's research in order to skyrocket to fame.

WATSON. But she wasn't [in the laboratory,] was she. She was too busy snow-shoeing and ... enjoying things like ... nature and small woodland creatures.
CRICK. I mean, didn't she feel that something was at her back, a force greater than she was ...
WATSON. You mean us?
CRICK. No. I mean fate.
WATSON. What's the difference?

Related Characters: Francis Crick, James Watson (speaker), Rosalind Franklin

Page Number: 21

Explanation and Analysis

In this passage, Watson and Crick, functioning as a kind of chorus, discuss the many impromptu solo camping and hiking trips Rosalind would take rather than showing up to work in the laboratory at King's College. The men are baffled by Rosalind's desire to isolate herself from her research—and, in their estimation, waste precious time that could very well have allowed her to win the "race" toward the discovery of DNA's structure had she spent it more wisely. Watson and Crick also compare themselves to fate itself, invoking the play's theme of choices and actions versus chance and fate. The men wonder if Rosalind ever felt the ticking clock of her life pressing "at her back," or if she ever sensed them as her competitors in the "race" that would come to define her professional life. There is no difference, in Watson and Crick's view, between the realm of human choice and action and the larger realm of chance and fate—all four forces conspire to weigh on and influence

a person's life.

WATSON. It's just incredibly exciting.

WILKINS. What is?

WATSON. To be born at the right time. There's an element of fate to it, don't you think? And I don't believe in fate.

Related Characters: Maurice Wilkins, James Watson (speaker)

Page Number: 23

Explanation and Analysis

As James Watson, a young, confident, brash American scientist encounters Maurice Wilkins at a conference in Naples, he approaches the older man and begins complimenting him on his work in hopes of securing a place in the laboratory at King's College—and a mentor in the "race" to discover the structure of DNA. James is cocky and over-sure of himself, yet at the same time he exhibits a profound self-awareness of how lucky he is to have been "born at the right time." As a man of science, he's been trained not to believe in what he can't see—and that surely includes the forces of fate and chance—but there's a part of Watson that believes he was born to be in this race. Watson's arc ties in intimately with the themes of choices, actions, chance, fate, and time. He is always in a race against himself and everyone around him, determined to make the most of his fortuitous timing and prove himself in his chosen field no matter what obstacles stand in his way.

ROSALIND. *(Condescendingly.)* Flushed with pride, are we?

WILKINS. I beg your pardon?

ROSALIND. X-ray patterns you made?

WILKINS. It was just a manner of speaking. Everyone knows who's on the team, that there is a team.

ROSALIND. Well, I don't know which X-ray patterns you were looking at, but in the ones I took, it's certainly not clear that there is a helix.

WILKINS. It's like you're unwilling to see it.

Related Characters: Maurice Wilkins, Rosalind Franklin (speaker)

Page Number: 28

Explanation and Analysis

After Maurice Wilkins delivers a lecture at King's College which incorporates Rosalind's research—but subtly passes her work off as his own—Rosalind confronts her difficult colleague. Wilkins gives into sexist tropes and behaviors as he attempts to tell Rosalind that she's overreacting to his actions before insulting her professionalism and her research methods to boot. This passage shows how the pervasive patterns of sexism and petty cruelty Wilkins chooses to perpetuate in his relationship with Rosalind contribute to her desire to isolate herself from him, creating a vicious cycle in which both of their research is hindered, stunted, and prevented from reaching its full potential. Wilkins is frustrated with Rosalind's methods—but as he goes behind her back, discounts her contributions and findings, and steals her glory for himself perhaps in an attempt to force her to give in to him, he only isolates her further.

CRICK. She's really that bad?

WILKINS. Worse.

WATSON. The Jews really can be very ornery.

WILKINS. You're telling me.

WATSON. Is she quite overweight?

WILKINS. Why do you ask?

CRICK. James is many things but subtle is not one of them. […] You see, he imagines that she's overweight. The kind of woman who barrels over you with the force of a train. […]

CASPAR. *(To the audience.)* To Watson and Crick, the shape of something suggested the most detailed analysis of its interior workings. As though, by looking at something you could determine how it came to be ... how it gets through each day.

Related Characters: James Watson, Maurice Wilkins, Francis Crick (speaker), Rosalind Franklin

Page Number: 31

Explanation and Analysis

At the height of his frustration with Rosalind, Wilkins seeks out the company of an old friend, Francis Crick, and Crick's new research partner, the headstrong young scientist James Watson. As he vents to his male colleagues about his anger toward Rosalind, Watson and Crick chime in and begin discussing Rosalind in sexist, antisemitic terms. At the height of the men's cruelty, Don Caspar—Rosalind's soon-

to-be assistant—steps in to defend her, explaining the ways in which the men's scientific training has caused them to think in narrow, crude ways. These three men's repeated verbal cruelty towards Rosalind causes them to think of her as an enemy or a rival rather than an intelligent colleague. Their treatment of her causes her to isolate herself from them further, which only fuels their vitriol toward her—and their feelings that she should, perhaps, be more grateful just for a seat at the table. These pervasive and destructive patterns ultimately result in Wilkins' betrayal of Rosalind, allowing Watson and Crick to piggyback off of her hard work and claim credit for her ideas and breakthroughs, a mystery the play endeavors to solve by examining all sides of it.

ROSALIND. As a girl, I prided myself on always being right. Because I was always right. I drove my family near mad by relentlessly proposing games to play that I'd win every time. […] And when I was at university, and it was becoming as clear to my parents as it always had been for me that I would pursue science, I left Cambridge to meet my father for a hiking weekend. *(Staring again at the image.)* And atop a mountain in the Lake District, when I was eighteen years old, he said to me, "Rosalind, if you go forward with this life… you must never be wrong…"

Related Characters: Rosalind Franklin (speaker), Ray Gosling

Related Symbols:

Page Number: 35

Explanation and Analysis

In this passage, Rosalind Franklin and her research assistant, the young and eager Ray Gosling, have just developed a photo they've recently taken with their X-ray machine. It is the 51st photograph of DNA they've taken—and little do they know that it will be remembered throughout history as an infamous object which provided humanity with the first glimpse of DNA' structure. As Rosalind and Ray stare at the photograph, Ray has an inkling of what it is the photo reveals—and though Rosalind does too, she insists on downplaying its importance, keeping it in a desk drawer, and hiding it from Maurice Wilkins. As Rosalind privately delves into memoir in this monologue delivered as an aside to the audience, she reveals the reasoning behind her desire to keep the groundbreaking photograph private for now. As a woman in science, she knows that she "must never be wrong." In other words, she can't risk losing her already-tenuous credibility within her sexist and antisemitic community. This passage explains a lot of the reasoning behind Rosalind's desire to keep her research close to the chest, work in isolation, and take her time delivering the results of her work—things that frustrate and anger her colleagues as they encourage her to collaborate, speed up, and participate more fully in the "race" to uncover the structure of DNA.

WILKINS. But what are we celebrating??

GOSLING. It's amazing, really—

ROSALIND. Have some faith in me. There is something to celebrate. Take a leap of faith.

WILKINS. *(Bitterly.)* As though you would ever do that. […] I mean, my God, can you even hear yourself? The irony?

ROSALIND. *(Slowly.)* I take a leap of faith every day, Maurice, just by walking through that door in the morning ... I take a leap of faith that it'll all be worth it, that it will all ultimately mean something.

WILKINS. I don't know what you're talking about.

ROSALIND. No, you wouldn't.

Related Characters: Rosalind Franklin, Ray Gosling, Maurice Wilkins (speaker)

Related Symbols:

Page Number: 36

Explanation and Analysis

After the discovery of what Photograph 51 may hold, Rosalind makes the controversial decision to put it away in a drawer and keep her findings from her research partner, Maurice Wilkins. Rosalind knows that if the photograph contains nothing and she is wrong about its potential, she'll be laughed at and shunned. But she also knows that if it holds the key to DNA's structure, it might be taken from her by Wilkins and passed off as his own achievement. When Wilkins walks in on Rosalind and Gosling resolving to celebrate, he wants to know what there is to celebrate—and when Rosalind refuses to tell him, an ideological fight ensues.

This passage contains the secret to the animosity between Wilkins and Rosalind, as does the scene directly preceding it. Rosalind has ways of moving through the world and conducting her work that are designed to protect her

tenuous position in the scientific community—methods that Wilkins cannot understand, and that Rosalind is loath to share. They can never step into one another's shoes and see things from the other's point of view, and this tension and frustration poisons their working relationship and their personal estimations of one another. Rosalind resents Wilkins for not understanding her (or even trying to), and Wilkins resents Rosalind for behaving in a way which confounds him. As a result, they continue to misunderstand and discount the other, making fruitful collaboration an impossibility.

CRICK. And what is a race anyway? And who wins? If life is the ultimate race to the finish line, then really we don't *want* to win it. Shouldn't want to win it. Should we? [...] Or maybe the race is for something else entirely. Maybe none of us really knew what we were searching for. What we wanted. Maybe success is as illusory and elusive as ... well, Rosalind was to us.

Related Characters: Francis Crick (speaker), Rosalind Franklin

Page Number: 37

Explanation and Analysis

Francis Crick has been working hurriedly and tirelessly alongside his partner, James Watson, to repeatedly model and attempt to discern the structure of DNA. The two men have been devoted to winning the "race" they're in with their other colleagues in England and around the world, and they harbor dreams of fame, recognition, and lifelong security should their endeavor be a success. In this passage, however, Crick stops to breathe for a moment and concedes that he's confused about the goals and merits of their breakneck race. The men have been struggling to understand how Rosalind could possibly resist throwing her entire life into the race and devoting every moment to getting ahead. And in this passage, Crick at last begins to understand that perhaps there is more to life than coming in first. Perhaps the desire for success and recognition, he's coming to realize, is foolish or fruitless—perhaps, he concedes, Rosalind understood something about the nature of time, fate, and life that he and Watson never did.

WATSON. Do tell us what our little ray of sunshine is keeping busy with these days.

CRICK. *(Actually worried.)* Wilkins, old boy. Are you sure you're quite all right?

WATSON. Anything new on her docket? If you don't mind sharing, that is.

WILKINS. I honestly couldn't give two damns. I'm happy to tell you all I can remember.

Related Characters: Maurice Wilkins, Francis Crick, James Watson (speaker), Rosalind Franklin

Related Symbols:

Page Number: 44

Explanation and Analysis

In this passage, Wilkins, frustrated by Rosalind's closed-mouth approach to sharing her research and her unwillingness to collaborate, visits Cambridge to vent his anger to their colleagues Watson and Crick.

Watson is eager for Wilkins to share the details of Rosalind's vexing behavior for his own amusement, while Crick is "actually worried" about Wilkins's mental state and stunted professional life. This illustrates the differences between Watson, who is more focused on professional success, and Crick, who is more focused on personal values. Of course, Watson and Crick are both motivated by the desire for professional acclaim and glory—and Wilkins is too. But in highlighting a discrepancy between Watson and Crick, the play suggests that in a cutthroat environment like the scientific research community, there is always tension between the personal and the professional. Wilkins, who (like Watson and Crick) dreams of professional glory, turns to the likeminded pair out of frustration with Rosalind. Rosalind is more interested in the thrill of her work and the fulfillment she gets from making discoveries that could help people—but she doesn't leap to gloat about her findings or share them with the wider scientific community.

Wilkins, however, cannot understand the societal barriers—namely sexism and antisemitism—that have led Rosalind to be guarded about to her work. As a result, he insensitively gossips about her behind her back and even shares her work without her permission. He's unaware that Watson and Crick are still working on DNA research, and that sharing Rosalind's X-ray photo of DNA (the titular Photograph 51) with them will lead to Watson, Crick, and Wilkins winning the Nobel Prize without Rosalind receiving her due credit. Rather than patiently waiting for Rosalind to share her findings with him or attempting to understand the

intentions behind her peculiar methods, Wilkins unintentionally betrays her to their rivals. This is a testament to how differences in values and in personal experience—Wilkins has no idea what it's like to experience sexism or antisemitism, after all—can drive a wedge in professional relationships.

CASPAR. Watson and Crick got hold of the paper Rosalind had written. It was confidential.

CRICK. It wasn't confidential. Another scientist at Cambridge gave it to us. […]

WILKINS. Well it wasn't published, that's for sure. And it included [….] information that became critical to your work.

WATSON. I'm sure we would have gotten there sooner or later, even without it.

WILKINS. So would we have done, with the benefit of your work. You had ours but we didn't have yours!

WATSON. There was no "we" where you were concerned. […]

GOSLING. Anyway, it doesn't matter how they got the paper, only that they got it.

CASPAR. And that Rosalind didn't know she should be in a hurry.

Related Characters: Ray Gosling, James Watson, Maurice Wilkins, Francis Crick, Don Caspar (speaker), Rosalind Franklin

Page Number: 46

Explanation and Analysis

In this passage, Ziegler allows her characters to step outside of time and space and address one another directly as they confront the betrayals, failures, and insufficiencies of their personal and professional relationships. As Watson and Crick essentially steal ideas from Rosalind's careful research, Wilkins—who has, up to this point, had few qualms about sharing her materials with them—is at last able to see that they're being cruel and unfair. Previously, he wasn't even aware that Watson and Crick were still working on DNA research, so he didn't suspect that they had an ulterior motive. But here, he calls them out on their repeated infringements of Rosalind's work. Outside of the action, separated from the events that occurred in his lifetime, he is able to see how unfair the situation was all along—and how profoundly the deck was stacked against himself and Rosalind for a multitude of reasons, Watson and Crick's self-serving ambition being one of them. The forces of time are working against Wilkins and Rosalind, but largely because of Wilkins's own actions, which he now appears to regret.

ROSALIND. I think I'm thinking about how I've come to the end of thinking. […]

WILKINS. We could talk it through. It might help. […]

GOSLING. For a moment, everything stopped. Different ways our lives could go hovered in the air around us. […]

ROSALIND. You know, I think I am going to call it a night. I haven't been home before midnight for a fortnight and really what's the point of being here and not getting anywhere? […]

GOSLING. And then there was only one way everything would go.

Related Characters: Ray Gosling, Maurice Wilkins, Rosalind Franklin (speaker)

Related Symbols:

Page Number: 51

Explanation and Analysis

In this passage, Maurice Wilkins walks in on Rosalind sitting in the laboratory late at night, puzzling over Photograph 51 and attempting to discern its meaning. Rosalind expresses her frustration with the photo, at which point Wilkins offers to help her—if only she'll open up to him about her thoughts. "For a moment," their assistant Gosling observes from the sidelines, the possibility that the two scientists might put aside their pride, their resentments, and their fears and at last collaborate in pursuit of a shared goal hangs in the air—but it dissipates as Rosalind turns Wilkins down, unknowingly making a move that will forever impede them from winning the race to uncover the structure of DNA. This passage is significant because it ties in with so many of the play's themes: the ways in which human choices and actions unknowingly turn the tides of fate and chance, the fickle and unforgiving nature of time, and the tension between the desire to live one's life (and do one's work) in isolation versus the need to collaborate, share, and commune with other individuals. Rosalind and Wilkins have, in this passage, one final chance to turn the tides of fate, but neither of them seizes it, and instead their failure to win the race is forever sealed.

GOSLING. There's no science that can explain it. Loneliness. […]

CASPAR. Rosalind? *(She clutches her stomach.)*

WATSON. It works, Francis. It works. *(A very long beat.)*

CRICK. It's ...

WATSON. I can't believe it.

CRICK. It's life unfolding, right in front of us. *(Rosalind doubles over in her chair, and gasps.)*

CASPAR. Rosalind?

WILKINS. It's the loneliest pursuit in the world. Science. Because there either are answers or there aren't.

Related Characters: Maurice Wilkins, Francis Crick, James Watson, Don Caspar, Ray Gosling (speaker), Rosalind Franklin

Page Number: 54

Explanation and Analysis

In this scene, two different locations—and two very different happenings—are highlighted simultaneously. In Cambridge, Crick and Watson finalize their new model of DNA, which they've built using research cribbed from Rosalind's lab. Back in London, Rosalind, who has finally consented to have dinner with her new research assistant, Don Caspar, experiences intense abdominal pain, which she'll soon learn is due to a diagnosis of ovarian cancer. While Watson and Crick unfairly uncover the secret of life, Rosalind's life begins coming to a swift and unfair end. There are thematic and circumstantial similarities to be found between the two scenes, even as, ironically, all of Rosalind's work to ascertain the origins of life end in her death. Wilkins, distraught and overwhelmed by the cruel twists of fate he's witnessing, steps forward to comment upon the cruel loneliness science offers—providing answers to those who don't deserve them while denying any sense of logic or fairness to those who have been pursuing truth and transcendence for so long.

ROSALIND. We lose. In the end, we lose. The work is never finished and in the meantime our bodies wind down, tick slower, sputter out.

WILKINS. Like grandfather clocks.

Related Characters: Maurice Wilkins, Rosalind Franklin (speaker)

Page Number: 56

Explanation and Analysis

In the midst of her battle with ovarian cancer, which has taken the form of two large tumors, one in each ovary, Rosalind leaves the hospital in order to return to her laboratory at King's College London and continue work—even though she's ill, and even though Watson and Crick have already won the DNA "race." Maurice Wilkins is surprised to see Rosalind back at work and asks her what she's doing there. In response, Rosalind grimly states that there are still things she wants to accomplish before she dies, and then laments the frail, doomed nature of the human body. Wilkins states that bodies—and lives—are "like grandfather clocks," thus admitting to his own anxieties about the inevitability and terror of time. The ways in which time serves as humanity's enemy are thematically at play throughout the entire drama—but only now, as it draws to the close, do two of its characters outrightly lament the fact that time has bested them.

ROSALIND. If I'd only ...

GOSLING. Been more careful around the beam.

WATSON. Collaborated.

CRICK. Been more open, less wary. Less self-protective.

CASPAR. Or more wary, more self-protective.

WATSON. Been a better scientist.

CASPAR. Been willing to take more risks, make models, go forward without the certainty of proof.

CRICK. Been friendlier.

GOSLING. Or born at another time.

CRICK. Or born a man.

Related Characters: Don Caspar, Francis Crick, James Watson, Ray Gosling, Rosalind Franklin (speaker), Maurice Wilkins

Page Number: 57

Explanation and Analysis

In this brief passage, Rosalind thinks about the what-ifs of her life. Her male colleagues, acting as a kind of chorus, step forward to enumerate her regrets.

One reading of this passage is that Rosalind's colleagues (Gosling, Watson, Crick, and Caspar) are offering up their honest guesses as to how Rosalind might have attained professional glory. But another interpretation is that the men are somehow channeling Rosalind's own curiosities

about what she might have done differently over the course of her life, and how different choices along the way might have affected the outcome of her life.

Up until this point, Rosalind's male colleagues have been largely unsympathetic about what they perceive as her professional and personal shortcomings—yet now, their comments read as compassionate and regretful. The men, whose treatment of Rosalind has ranged from outrightly cruel to simply insufficiently kind or helpful, now concede that there were several barriers (many of which they themselves created or contributed to) that stood between her and the professional renown that her work deserved. In other words, the men seem to finally empathize with the struggles Rosalind has faced as a Jewish woman who's been held back by sexism and antisemitism. They acknowledge both the concrete circumstances and uncontrollable forces (like Rosalind's cancer diagnosis) that contributed to her personal and professional failures—and they collectively join her in lamenting the hardships that held her back for so many years.

WILKINS. And they do. I love that Hermione wasn't really dead. That she comes back.

ROSALIND. *(Sympathetically.)* No, Maurice. She doesn't. Not really.

WILKINS. Of course she does.

ROSALIND. No.

WILKINS. Then how do you explain the statue coming to life?

ROSALIND. Hope. They all project it. Leontes projects life where there is none, so he can be forgiven.

Related Characters: Rosalind Franklin, Maurice Wilkins (speaker)

Related Symbols:

Page Number: 59

Explanation and Analysis

In the play's final moments, Wilkins and Rosalind return to the one topic which allowed them to share some common ground during their uneasy partnership at King's College. Suspended in time and space. Wilkins and Rosalind discuss *The Winter's Tale* and their differing opinions on its fantastical ending offer a metaphysical reading of their own story. While Wilkins believes that Leontes's grief and contrition succeeds in summoning his wife Hermione back from the dead, Rosalind believes Leontes merely "projects life" in order to ease his guilty conscience, then ultimately winds up alone in the end. This passage reveals Wilkins' enduring desire to somehow right the wrongs he leveled against Rosalind during her life—he treated her as badly and unfairly as Leontes treated his queen, and now must face the fact that he cannot bring Rosalind back from the dead, atone for his sins against her, or rewrite their painful shared history.

SUMMARY AND ANALYSIS

The color-coded icons under each analysis entry make it easy to track where the themes occur most prominently throughout the work. Each icon corresponds to one of the themes explained in the Themes section of this LitChart.

PHOTOGRAPH 51

The stage lights come up on Rosalind Franklin. In romantic, nostalgic terms, she describes the work she and her colleagues did to make "the invisible visible." Their work, she says, made them feel "powerful." But though they could "see everything," Rosalind admits that sometimes they missed things that were right in front of them.

The opening lines of the play introduce its form: the action is suspended out of time, with rapid scene shifts that highlight the most crucial moments of Rosalind's career. Her combined excitement and regret are also palpable—at the height of her "power," she was still not infallible.

Rosalind recalls how, throughout her childhood, she constantly drew shapes—endless and miniature "repeating structures." She remembers playing with her father's camera as she photographed leaves in the yard, but at the height of her reminiscence, Maurice Wilkins steps in and begins a reminiscence of his own. As he begins to recall aloud the events of January 1951, other voices join him—James Watson and Francis Crick help him to reconstruct a goodbye party taking place in Paris as Rosalind Franklin bid goodbye to her colleagues there and prepared to journey to London to undertake a fellowship at King's College.

The other characters in the play act as a kind of chorus. They frequently step in and comment upon the action. Their choral function adds to the play's theme of choices and actions versus chance and fate—everything that's unfolding onstage is predetermined and inevitable, and yet the characters will make attempts to resist their sealed fates at several points.

More voices continue adding to the chaos, reconstructing the background of Rosalind's decision to venture to London. Don Caspar and Ray Gosling join the fray and continue telling the story of Rosalind's arrival in London. Gosling tells about how Rosalind wrote a letter in advance of her arrival detailing the materials she'd need. Rosalind reads the letter aloud—the letter, addressed to Wilkins is "cold and formal." Wilkins writes back to Rosalind's letter, addressing her as "Miss Franklin" as he informs her that she'll be working in "another area entirely."

From the get-go, it's clear that Rosalind's direct, cool, and no-nonsense personality rubs her colleague and collaborator, Maurice Wilkins, the wrong way. He tries to remind her of her place by addressing her diminutively as "Miss Franklin," refusing to refer to her by the title of "Doctor" she has worked just as hard as he has to attain.

The action shifts suddenly. Rosalind is at King's College with Wilkins, who informs her that she won't be working on proteins, as promised, but instead on "deciphering the structure of DNA" due to her expertise in X-ray crystallography. As Wilkins explains that she'll be assisting him, Rosalind turns icy and angry. Even as Wilkins introduces Rosalind to her own assistant, Gosling, Rosalind remains irate. She explains that she was told she'd be in charge of her own research. Wilkins calmly, blithely tells her that "circumstances [have] changed," and all hands must be on deck in the race to discover the structure of DNA—"the secret of life."

This passage makes it clear that while Rosalind believed she was being brought to King's College on merit of her accomplishment, she's really just been brought in to be another body working in the quickly accelerating "race" with which most of the world's scientists are concerned. This discounts Rosalind's agency, and forcing her into collaboration ironically only isolates her more.

Rosalind proclaims that she refuses to work as anyone's assistant—she likes to do her own research and works best alone. Wilkins encourages Rosalind to think of their work together as a "partnership." Rosalind storms off, furious.

Wilkins condescends to Rosalind even as she calmly and clearly expresses herself. He does not take her seriously because she is a woman.

Watson, Crick, and Caspar step in to comment on what's just happened. Watson says the "race [was] lost […] in a single moment" as soon as Rosalind realized she'd been brought to King's under false pretenses. Wilkins tells him that he's wrong, but Caspar agrees with Watson—Rosalind, he says, would never have left Paris had she known what really lay in store for her. The men begin ribbing one another and arguing until Gosling steps in and reorients the action back to Wilkins's and Rosalind's "dank cellar" of a laboratory.

Again, the other characters function like a chorus in this passage as they debate whether Rosalind's fate was sealed in a single instant, or whether her choices and actions still could have changed the course of her life. Because they exist outside of time, they have a new perspective on the events of their lives and histories.

Rosalind comments upon the gloomy nature of the lab, claiming that her working conditions in Paris were much more hospitable. Wilkins subtly chides Rosalind for "leav[ing] England when she needed [her people] most." Rosalind coolly replies that she was doing more for England in Paris than she would have been had she stayed behind during the war—then points out that Wilkins himself was in America during the war working on the Manhattan Project.

This passage shows that Wilkins and Rosalind are opposed not just because of the power dynamics between them, but because of their deeper politics, personalities, and beliefs. It also suggests Wilkins's hypocrisy in denigrating Rosalind for leaving England even though he did the very same thing during the war.

Rosalind adds that no female scientists from Britain were offered any research positions during the war, and then, finally, declares that she doesn't "approve" of nuclear force. Wilkins retorts that Rosalind's "lot" never does. Rosalind asks what he means, and Wilkins says, somewhat haltingly, that after all the hard work people did to "save […] the Jews," he's found Jewish people, ironically, disapproving of the methods taken to do so. Rosalind icily, sarcastically states that "Jews should be in a more grateful frame of mind these days." Wilkins shuts Rosalind down by telling "Rosy" she's won the argument. Rosalind corrects him, telling him that her name is Rosalind—but most people call her "Miss Franklin," even though she prefers "Dr. Franklin."

This passage shows that Wilkins is not only sexist but perhaps somewhat antisemitic as well. Rosalind bristles at Wilkins's language as he makes a blanket statement about Jewish people. She becomes increasingly cold, angry, and upset as she realizes just what her new workplace is really like—this is an environment where her sex and her religion precede her reputation as a scientist and an intellectual. She is indignant about having to fight for Wilkins's recognition of her achievements and her autonomy.

Gosling, hoping to cut the tension in the room, declares that it's already two in the afternoon—well past time for lunch. Rosalind agrees it's time for a break and asks Wilkins where they should go to eat. Wilkins matter-of-factly states that he dines in the senior common room—which is for men only. After a brief pause, Rosalind urges Wilkins to go on without her. Gosling stays behind in the laboratory with Rosalind, listening to her rail against the rampant sexism that saturates King's College. Rosalind is angry to be barred from the dining room—she knows that "scientists make discoveries over lunch."

Rosalind encounters more and more instances of sexism and exclusion as she adjusts to her first day at King's. She is barred from the lunchroom, a fact which incenses her as she knows that a large part of her profession is not hard science at all, but the connections one makes and the collaborations one becomes part of.

Rosalind asks Gosling what Wilkins is like, knowing they've worked together for a long time. Gosling tells Rosalind that Wilkins is "fine"—he is a hard worker who is divorced, and so he doesn't have the burden of a wife or a family. He is entirely devoted to his work. Rosalind retorts that she is just as devoted as Wilkins. Gosling tells Rosalind that she has his complete "allegiance"—he's been assigned to be her assistant and will do whatever she needs from him.

Gosling, at least, seems to deeply respect Rosalind and wants to help her—even if his allegiance toward her is, perhaps, born more out of fear or adherence to protocol than genuine reverence for her or her work.

Wilkins returns from lunch. Rosalind blithely asks him how his meal was, adding how "glad" she is that on her first day at the lab, he didn't break from his routing to bring her somewhere she was allowed to eat. Wilkins tells Rosalind—again addressing her as "Miss Franklin"—that he wants to be clear about how much he's been looking forward to working with her. He's upset that they've gotten off to a tough start and wants to "begin again." After a brief pause, Rosalind agrees. She sticks her hand out and re-introduces herself as "Dr. Rosalind Franklin." Wilkins re-introduces himself, too, and makes a big charade of asking Rosalind questions about herself, but she says she's ready to be done with playing "games" and start taking pictures of DNA crystals. She heads off to start her work.

Rosalind succeeds in getting Wilkins to realize the error of his ways and make apologies for his actions—but ultimately her trust has been broken, even as he tries to "begin again." Rosalind has realized what kind of environment this really is, and she's determined to keep her head down and get to work rather than get caught up in personal matters with a colleague who fundamentally disrespects her. Rosalind senses that she and Wilkins have very different values and priorities: she is devoted to the work, while he is concerned with appearances and with asserting his seniority over Rosalind.

Several days later, Rosalind and Wilkins are back in the lab after the weekend. Wilkins asks Rosalind how her weekend was, and she tells him that she went to a matinee of **The Winter's Tale** the day before. Wilkins says he almost went to the same performance—he passed the theater and almost went in but decided not to at the last moment. The two begin talking about the Shakespeare play, and Wilkins tells Rosalind that in the story on which the play is based, the heroine dies—while in Shakespeare's she survives. Rosalind says that John Gielgud, the actor who played Leontes, was terrific but adds that she can't remember the actress who played Hermione—the woman simply "didn't stand out." The two continue discussing the play, quoting from it in snippets and discovering that both their grandfathers once made habits of memorizing entire Shakespearean plays.

This passage introduces one of the play's major symbols—the production of The Winter's Tale *that Rosalind goes to see one weekend. The play is symbolic on one level because of its plot, in which a husband who has killed his wife so regrets his treatment of her that he brings a statue of her back to life. This parallels Wilkins's ill treatment of Rosalind and subsequent regret—his pleas to "begin again" with her will persist throughout the play. On another level, the play is significant because of the specific production Rosalind sees. She can't recall the actress who played the female lead, Hermione—a commentary upon the ways in which women are often forgotten or overlooked, and a foreshadowing of the fact that the same thing will soon happen to Rosalind (and in a way already has).*

As their friendly conversation dies down, Wilkins asks Rosalind what she's going to work on over the course of the morning. Rosalind says she wants to find an image of DNA that is useable in spite of the damaging lack of humidity in the camera. Wilkins says he supposes they need to fix the problem with the camera. "I suppose *we* do," Rosalind retorts.

Rosalind is upset and offended by Wilkins's subtle suggestion that she take care of their collective materials maintenance, a menial task that is beneath her. Just when things between the two of them seemed to be improving, Wilkins's underlying sexism—and Rosalind's acute sensitivity to it—clash once again.

Gosling comes forward to describe a correspondence Rosalind took up with a doctoral student in biophysics at Yale named Don Caspar after he wrote to her on the recommendation of his advisor, asking her for some X-ray images and other writings to aid in his PhD research. As Caspar and Rosalind write back and forth, it becomes clear that Caspar is more invested in the letters than Rosalind. He compliments her work in fawning but genuine terms, commenting upon the beauty of the "shapes within shapes" Rosalind's X-ray images reveal. He says he believes one is able to "see something new each time one looks at truly beautiful things."

Rosalind is in a professional situation where she's not taken seriously and condescended to every day—the play even suggests she's spending more time maintaining her materials than doing actual research. Don Caspar's letters reinforce her confidence at a time when she needs a serious boost. In Caspar, Rosalind finds a kindred spirit: someone who is mesmerized by the beauty of the work, rather than someone who's caught up in prestige, protocol, or the thrill of the "race." It seems there's still hope for Rosalind to find a working partnership that will fulfill her personal values as well as her professional aspirations.

Gosling steps forward and says that Rosalind was often away—sometimes she'd phone the lab after failing to show up and announce that she was hiking in Switzerland or having some other adventure. The action cuts to Rosalind, narrating her trek through the Alps to Gosling over the phone and describing how the beautiful, clean mountain air clears her head. She echoes Caspar's words, stating that looking at "truly beautiful things" allows one to see and understand something new each time.

This passage suggests that Caspar's letters inspire Rosalind to reclaim her life for herself and reframe her approach to her research. Rosalind continues to prioritize her personal values and inner intellectual life over the empty chase for professional glory. At the same time, her colleagues bristle as she heads off on lonely hiking trips without giving any prior notice. They are focused so intently on professional advancement that they can't imagine how someone could make time for personal fulfillment.

Commenting upon Rosalind's frequent departures, Crick says he supposes Rosalind must have felt "that something was at her back." Watson asks if Crick means the two of them, but Crick says he means "fate." Watson asks him what the difference is.

Here, Crick and Watson make a joke about how they are essentially Rosalind's fate. In their minds, it was somehow fated that they would succeed where she failed.

Back in the lab, Gosling helps Rosalind set up an X-ray shot. Frustrated with his work, Rosalind moves him aside and sets the shot up herself, stepping into the X-ray's path as she does so. Gosling turns to the audience and explains that he knew—and could feel—how dangerous exposure to the X-ray was but didn't want to rock the boat with Rosalind by chiding her for moving through it or refusing to do so himself. That night, when Rosalind dismisses Gosling for the evening, he begins to urge her to be careful but changes his words at the last minute and cheerily tells her not to stay too late at the lab. Caspar steps forward to comment, shocked by how casually Rosalind interacted with the X-ray beams—and by how reticent Gosling was to tell her to stop.

This passage demonstrates how determined Rosalind is to do her own research—and do it well. She puts herself directly in harm's way as she moves carelessly through the potent X-ray beams. Her actions here foreshadow the twists of fate her life will soon take as a result of her stubbornness and carelessness in the laboratory. This is a rare instance where Rosalind places professional clout over emphasis on cautious, measured work.

Wilkins steps forward, cutting the dark moment short. He begins telling a story about a conference in Naples, Italy in the spring of 1951. After Wilkins delivers a lecture explaining the importance of studying and understanding DNA, a young American scientist—Watson—approaches him and compliments his presentation, adding that Wilkins's lecture has inspired him to determine, once and for all, DNA's structure. Watson goes on to excitedly say that even though he doesn't believe in fate, he's thrilled to have been "born at the right time."

This passage introduces Watson in earnest. He is a hotheaded, eager, intelligent young man who is acutely aware of how the forces of time and fate impact a life, in spite of his relative youth. Watson's obsession with the way intangible forces interfere with human life shows that there is a more fanciful side to his scientific, academic brain. He claims not to believe in fate, yet his language suggests that he does.

Watson tells Wilkins that he wants to learn crystallography and come to work with him. Watson talks at length about himself and his background, explaining that his atheistic upbringing has inspired him to search for his own set of "instructions for life." He has come of age determined to crack the "secrets" of nature, and "the gene" is the biggest secret of all. He is determined to "get in the race," a statement that puzzles Wilkins, who insists that there is no race. He dismisses Watson out of hand and walks away—a move that Watson steps forward to say was perhaps the "biggest mistake of [Wilkins's] life." Wilkins steps forward and admits that he, too, has often wondered if he should have taken Watson on as a partner.

Again, the actions the characters take in their "real" life are immediately commented upon as soon as they step outside of the scene. This group of characters—perhaps because of the fortuitous, chaotic moment in which they live—is obsessed with fate and time, and with how those forces have impacted their lives and those of their colleagues.

Rebuffed by Wilkins, Watson approaches another scientist who takes him on and pairs him with Francis Crick, a young scientist whose drive to unlock the secrets of the world parallels and rivals Watson's own. As Gosling steps forward to comment on the men's partnership, he seems to envy their "impressive" bond and drive, remarking that he himself has never been so focused on anything in his life as they were on their research.

This passage shows that Watson and Crick are a force to be reckoned with. Their collaboration, Gosling suggests—unlike Wilkins's and Rosalind's—will yield favorable results for both of them. This is because their desire for professional glory above all else is in alignment—whereas in Rosalind and Wilkins are at odds when it comes to personal and professional values alike.

Back in the lab at King's, Wilkins returns from his conference and exchanges cool pleasantries with Rosalind—pleasantries that dissolve when he asks to see what Rosalind has been working on. Rosalind is reticent to show Wilkins her research. She explains that she's fixed the humidity issue in the camera. Wilkins tells Rosalind he's "impressed" by her, which she takes as a condescending comment. Rosalind bristles, and Wilkins, overwhelmed, becomes red and flustered.

This passage shows how even an innocuous interaction between Wilkins and Rosalind now holds tension and danger in every word uttered. They don't trust each other, as colleagues or as individuals, and are constantly looking for slights, oversteps, or points of disagreement.

Later on, in another part of the lab, Wilkins asks Gosling how he's supposed to get any work done if all his time is spent apologizing to Rosalind for the myriad tiny ways in which he offends her. Wilkins tells Gosling that other people around the world are "on DNA now," and that they must hurry and push forward if they want to be the first to determine the structure. Still, Wilkins admits that he's distracted by his own inability to get Rosalind to like him—and resolves to find a way to do so.

Wilkins knows that there are other people around the country and the world looking for the same things he is looking for. He also knows that as long as he and Rosalind are spatting and sparring, they don't stand a chance of winning the "race"— something he is increasingly eager to do. The play contrasts Wilkins's rash, harried approach to the work against Rosalind's slower but more passionate methods of conducting research.

The next day, Wilkins shows up to the lab with a box of chocolates for Rosalind. He hands them to her. She is confused and flummoxed. Wilkins explains that they've gotten off on the wrong foot, and he wants to set things right and start again. Rosalind points out that they've already "started again" once before. Wilkins says he wants an easier relationship with Rosalind, but she points out they're not supposed to have a relationship—they're supposed to have a partnership. Rosalind is not, she says, Wilkins's wife. Wilkins says he just wants to be her friend, but Rosalind retorts that she doesn't want to be his friend. Frustrated, Wilkins storms away.

Even when Wilkins tries to repair the bond between himself and Rosalind, her distrust of him keeps him from being able to make amends. This passage highlights how sometimes, one's can't be retroactively changed, indicting Wilkins for his earlier behavior even as it indicts Rosalind for her refusal to accept an apology, move on, and put science first. Ziegler is attempting to show just how complicated the forces of fate and time are, and how even repeated opportunities to get things back on course can fail when there's no good faith to be found.

Caspar writes Rosalind another gushing letter professing his admiration for her work and filling her in on his own progress with X-ray technology. He says he loves using the camera because it helps him feel like he's discovering the "secret[s]" of the world. Rosalind replies curtly to Caspar's letter, stating that she occasionally shares some of his thoughts—"it's nice to hear," she writes, "that one isn't alone."

Even though Rosalind is icy and aloof toward Wilkins, in her letters to Caspar, she softens and begins to reveal a little bit more of her true personality. She does so because she knows that Caspar truly respects her and her values, whereas she feels slighted and patronized by Wilkins on a daily basis.

Wilkins delivers a lecture in which he cites "his" research with X-ray patterns in the discovery of a clear central helix in the structure of DNA. Rosalind calls him out on his deceptiveness in claiming her research as his own—and tells him, moreover, that she believes his statement about a central helix is wrong. She has not come to that conclusion herself, and believes he is compromising their research and reputations by flaunting baseless claims to the world. Wilkins explains they have to share their findings if they want their funding to continue. Rosalind says she can't respect Wilkins if he's going to behave in such a way, and the two storm off.

This passage introduces another major obstacle in Rosalind and Wilkin's professional relationship. While Wilkins knows that a race is taking place and that one must participate in it in order to win, Rosalind wants to play things closer to the chest for reasons Wilkins can't possibly understand—reasons she'll soon explain. Wilkins cannot empathize with Rosalind in order to understand why she's so hesitant to release work that she doesn't feel is ready. He doesn't seem to understand that, as a Jewish woman, her work will be judged more harshly than his own—and that for this reason, she's learned to value the research process rather than the end product and the glory that comes with it.

Sometime later, Rosalind and Gosling peer at an X-ray image they've developed—it seems to show DNA in two forms. Caspar steps in to explain what they've found—the A form and B form of DNA, two structures that once appeared "on top of the other" but, due to Rosalind's visual separation of the two, can now be seen separately. Wilkins is excited by the development, but he and Rosalind are still not speaking. They attempt to communicate through Gosling as Wilkins asks Rosalind if they can collaborate on this new finding, but Rosalind insists that she will not share her data with anyone. Wilkins suggests they each study one form of the DNA—Rosalind reluctantly agrees.

This passage shows how, in spite of the strides they're making, Rosalind and Wilkins are hindering themselves by each stubbornly refusing to collaborate. Their hesitance to embrace each other's personal values is one thing—but they cannot even agree on a united approach to their professional collaboration. Their scientific work, this scene foreshadows, will be stalled and half-completed until they are able to meet each other halfway.

Crick and Watson step forward to explain just how close Rosalind was to discovering the structure of DNA—but because she believed in proving things, not hypothesizing or speculating, she didn't create any models, instead simply focusing on determining what she could see. As the days go by, Gosling and Wilkins pressure Rosalind to hurry up and make a model—the other researchers in their field are doing so—but Rosalind refuses.

Rosalind continues to stubbornly demand keeping her research to herself. Her collaborators—all of whom are male—can't understand her decision-making process in playing things so close to the chest. It never occurs to them that for a woman to make a crucial and public mistake could mean the end of her career.

Wilkins grows frustrated with Rosalind's stoniness and her unwillingness to collaborate, hypothesize, or make a model. He goes to visit Crick in Cambridge, and is surprised to find that Watson is there, too, as Crick's new research partner. Crick and Watson ask Wilkins about his work with Rosalind, asking if she's "ornery" like most Jews or overweight like most domineering women. Wilkins starts to defend Rosalind, but the two cut him off and begin asking about his research and whether he really believes DNA is a helix. Wilkins says that without Rosalind's half of the research, it's impossible to say for sure. Crick suggests Wilkins build a model, but Wilkins explains that "Rosy" is opposed to making models.

This passage introduces a pattern that will repeat throughout the rest of the play, and that will come to have disastrous effects for all players involved. As Wilkins grows frustrated with Rosalind, he begins to rely on Watson and Crick more and more. He vents his frustrations to them, allows them to reflect his own sexism and antisemitism back to him (albeit in more direct, overt language), and then lets them prey upon the weaknesses in his own professional relationship with Rosalind.

In November of 1951, at a colloquium on nucleic acid structure held at King's, Rosalind delivers a lecture while her colleagues watch. In the audience, Watson and Crick speculate about how attractive "Rosy" would be if she "took off her glasses and did something novel with her hair." Throughout her lecture they continue criticizing her and, afterwards, when they meet her and shake her hand, they think she is "a cipher where a woman should be."

This passage shows just how much Watson and Crick disrespect Rosalind. In the middle of her own lecture, they refer to her cruel, sexist terms, evaluating her not on the merit of her contributions to their shared field but on her perceived failures to be feminine enough for their tastes. By situating Watson and Crick as audience members here, Ziegler implies that the other men in the audience may be thinking the same things.

A week later, Watson and Crick have made their model. They invite the researchers from King's to come see it. Rosalind is skeptical of the model the men have made—it's clear that they didn't listen to any of her lecture the week before, statements in which directly contradicted the model the men have now made. Wilkins agrees that the men's model is incorrect, and suggests Watson return to America, "where theft and burglary are upheld as virtues." Wilkins and his team leave Cambridge in a fury, and Watson and Crick are ordered by their superior to stop research on DNA.

While in this passage Wilkins and Rosalind are offended and disgusted by the ways in which Watson and Crick have plagiarized their ideas, the play will go on to show how, as the relationship between Wilkins and Rosalind continues to break down, Wilkins will sacrifice his morals and values in order to ride along on Watson and Crick's coattails.

Back at King's, Gosling excitedly shows Rosalind the most recently developed X-ray photograph they've taken of DNA. As they stare at it, Rosalind remarks that she's never seen anything like it. Caspar and Watson identify the thing she's looking at as the infamous **Photograph 51**. Gosling states that the photograph clearly shows a helix—Rosalind corrects him, stating that it "*looks to be* a helix." Caspar and Crick wonder what could have possibly been going through Rosalind's head as she looked, uncomprehendingly, at the photograph revealing the structure of DNA.

This moment represents one of the play's most acute moments of dramatic irony. As Rosalind and Gosling look at the largest piece of evidence in favor of DNA's helical structure they've gathered so far, they don't quite believe their eyes. Their colleagues, however, look on from their choral pedestals and remark on the value and immensity of the object Rosalind and Gosling unknowingly hold in their hands.

Rosalind steps forward and delivers a flashback to a camping trip with her father while she was in university. He warned her that if she were to go forward with a career as a scientist—a woman scientist at that—she "must never be wrong."

This passage explains much of Rosalind's hesitancy to ever take her preliminary research and findings public—she knows things will be far more damaging and disastrous for her if she messes up than they will be for her male colleagues.

Back in the lab, Rosalind puts **Photograph 51** away in a drawer. Gosling asks if they should show it to Wilkins, but Rosalind doesn't want to do so. As Wilkins enters the room and asks what's going on, Rosalind toys with him, asking him to help them celebrate but refusing to tell him what it is they're celebrating. She urges Wilkins to take a "leap of faith." Wilkins retorts that Rosalind should take her own advice. She in turn states that just coming into the lab every day is, for her, a leap of faith.

Rosalind is in a good mood and wants to encourage Wilkins to trust her—but their relationship is so deteriorated at this point that he's unwilling to do so. He perceives her closed-off nature as a direct slight rather than a survival mechanism she's developed to preserve her professional integrity.

Rosalind and Wilkins begin arguing. Wilkins says he's never encountered a woman of "such temerity," and Rosalind suggests that Wilkins hasn't encountered very many women at all. She calls attention to his failed marriage to a woman who lives, with their son, in America. At the mention of his ex-wife, Wilkins goes off on a diatribe, calling Rosalind a hypocrite and condemning her research methods which make "no room for … humanity." He storms out of the lab, furious. Gosling steps forward. Later that night, he reveals, he slipped **Photograph 51** to Wilkins, believing the man had a right to see it.

Rosalind and Wilkins's animosity toward each other has become intensely personal and vitriolic, as their argument in this passage shows. The two are so frustrated with each other that they resort to personal insults and pettiness. Their relationship has deteriorated profoundly—and Gosling knows they're both wrong. Gosling's actions here show that he values the integrity of the important work they're all doing over personal squabbles. He claimed his allegiance was to Rosalind above all else—but his actions in this passage show that he's primarily concerned with sharing the groundbreaking information contained in Photograph 51 with the wider world.

Caspar writes Rosalind to tell her that he has graduated from his PhD program—he is officially a doctor. He asks if there is a fellowship at King's he might be able to apply for—he wants to come work with Rosalind. Rosalind writes back to Caspar, congratulating him on becoming a doctor and assuring him that many new opportunities will soon be available to him as a result of his degree. The same has not been true for her, she says, as she's had to keep her head down and do her work in an attempt to prove herself.

Even though Rosalind is happy for Caspar, she can't help but feel a twinge of jealousy as she considers the ways in which his fledgling career will surely be easier than hers, simply because he is a man and she is a woman.

Watson, watching the above exchange, chimes in and states how ludicrous it was for Rosalind to "be in the race and ignore it." Crick challenges Watson, asking what a "race" is anyway and how one can tell who's won it. He wonders if "none of [them] really knew what [they] were searching for" all along, and whether Rosalind was right about keeping her head down and focusing on the work rather than chasing a false idea of success.

Watson thinks only about his own advancement and is amazed by others who seem focused on other things like personal relationships or private professional satisfaction. Crick, though, harbors a quiet admiration for Rosalind's personal and professional conduct and for the things she values above her own glorification.

Watson flashes forward to January 1953. Watson travels to London, bringing with him a paper on nucleic structure one of his and Crick's colleague has just published—which is flawed in some ways but close to the truth in others—to Rosalind and Wilkins's lab. Watson shows Rosalind the paper, and she laments that the "rush to publish" is filling scientific publications with errors. Watson tries to ask Rosalind what she thinks about the structure of DNA, but she is reluctant to tell him. Rosalind of accusing Watson of "insulting" her intelligence by trying to prey upon her research and knock her off course. Watson changes tack and tries to earnestly appeal to Rosalind, insisting that they're both close enough to finding the answers that sharing their research could genuinely help one another, but she orders him out of the lab.

There is a part of Watson that genuinely wants to solve the problem of DNA for reasons larger than his own personal and professional glory, but this passage shows how that root desire has isolated him and made him an undesirable colleague and collaborator. Rosalind may be isolating herself, but Watson is on the verge of doing the same.

Watson goes down the hall to Wilkins's office and vents to him about Rosalind being an "old hag." Wilkins agrees that Rosalind is a lot to take and a horror to work with. Watson laments that Wilkins is Rosalind's partner and not his. He suggests that Wilkins would be better off without Rosalind and should stop trying to collaborate with someone who makes it "impossible to get along." Wilkins says he's stayed with Rosalind because of her work and produces from his desk the print of **Photograph 51**. Watson takes one look at the photo, becomes overwhelmed, and rushes out the door.

In this passage, Wilkins, again, fails to stand up for Rosalind when one of their colleagues goes on a sexist tirade against her. He tries, weakly, to point out the ways in which Rosalind is talented and useful—but this, too backfires as he accidentally (or perhaps knowingly) betrays Rosalind and gives Watson the key to winning the race.

On the train back to Cambridge Watson sketches what he can remember of the image, realizing that it is the key to DNA—and the Nobel Prize. Back at his lab, he confronts Crick and tells him that he has found an image that confirms DNA's double helix structure, and that they need to start building a new model right away. Wilkins and Rosalind, he says, have no idea that they are the ones with the answer to DNA's secrets. Wilkins steps forward, claiming that he didn't give Watson the photograph until Watson asked for it directly—but Gosling steps up and cuts him off, reporting that later that same week, Don Caspar arrived from America to come work at King's.

Wilkins clearly doesn't want to claim responsibility for the role he played in allowing Crick and Watson to win the "race"—but Gosling's swift movement forward away from Wilkins's protestations shows that sometimes the actions one takes and the choices one makes are sealed forever and cannot be backtracked, amended, or qualified.

As Caspar arrives at the lab, Wilkins shows him around and introduces him, at last, to Rosalind—whom Wilkins calls "Miss Franklin." Caspar, however, greets Rosalind as "Dr. Franklin." He is clearly spellbound by her and struggles for words, finally blurting out that he'd imagined her blonde. Rosalind asks Caspar if he knew she was Jewish, and he says he did—he tells her that he is, too. Rosalind tells him that with Caspar's arrival, there are now officially two Jewish scientists at King's.

Caspar takes Rosalind seriously as a scientist. He respects her not in spite of but because of the fact that she's a woman—and a Jewish woman at that. He can see that she is working against all manner of sexist, antisemitic forces each day she shows up to work, and therefore understands Rosalind on a deeper level than any of her present colleagues do.

A few days later, Crick invites Wilkins to come to Cambridge for dinner, and Wilkins accepts. When he arrives, he finds that Watson is there, too. As the three men drink, Wilkins tells Watson and Crick he's still frustrated by Rosalind and has been fantasizing about moving out to the country. Watson says it's hard to meet women outside the city. Wilkins asks Crick about his marriage, and Crick says he's happy with his wife—but it seems as if he's hiding a kind of melancholy. Wilkins sadly worries that it's too late for him to "begin again" when it comes to romance.

Wilkins, Crick, and Watson all seem to be suffering in their personal lives. They have failed at romance in their own respective ways, and Ziegler suggests that these failures galvanize and bond them both personally and professionally. Their struggles in their personal lives are also evidence of their constant valuation of professional success over allegiance to their values.

Watson switches the subject to DNA and asks if Wilkins has any new research to report. He says he doesn't. Watson asks what Rosalind has been up to, and though Crick seems reluctant to pry at first, soon echoes Watson's questions about Rosalind's work. They ask what she's writing and whether she's building a model—Wilkins surprises the men by stating that Rosalind is, for the first time, flirting with the idea of making a model of strand B. Watson and Crick confide in Wilkins that they, too, are planning another crack at a model—using the research Wilkins has shared with them. Gosling steps forward and states that what Watson and Crick are neglecting to mention is that they've already begun their new model.

Wilkins can't yet see the full scope of the situation he's found himself in—but the "chorus" can. Watson and Crick are exploiting Wilkins's weak partnership with Rosalind in order to extract their work. And Wilkins, frustrated and threatened by Rosalind, is letting them get away with it. Wilkins doesn't know the full extent of what Watson and Crick are up to—but either way, the chorus implies that he should have a more guarded investment in his partnership with Rosalind and take better care of their research.

Crick and Watson encourage Wilkins to make his own model—he says that he can't as long as "Rosy" is around, and is surprised that Crick and Watson, having already failed once, are ready to try a model again. He confesses that if he'd known they wanted to make another, he wouldn't have shown Watson **Photograph 51**.

Wilkins is realizing that he's unwittingly helped his rivals to advance their own careers—and to use his and Rosalind's research against them.

Time moves forward. Gosling explains that things begin moving "quickly" as Watson and Crick get their hands on Rosalind's new paper—which is confidential. They claim to have gotten it from another scientist at Cambridge after it was circulated to one of his committees, and Watson states that even without the paper, he and Crick would've been able to make their model anyway. Wilkins steps forward and says he and Rosalind would have been able to make their own, too, had the exchange of information among the four scientists been equal. Watson points out that Wilkins and Rosalind, though, were never really a team.

This passage highlights the personal and professional subterfuge fueling the "race" in which all four scientists have found themselves. Watson and Crick prey upon the weaknesses in Rosalind and Wilkins's personal and professional relationships in order to serve their own needs. Because things are so strained between Wilkins and Rosalind, they can't even begin to band together to do the same.

Back at the lab, Rosalind and Caspar find themselves working together more and more. There is clearly sexual tension between the two of them, and yet Rosalind is skittish and cold around Caspar. When he calls her Rosalind, she chides him for not calling her Dr. Franklin, but Caspar admits earnestly that he just likes using Rosalind's name because it makes him feel warm. Rosalind points out that no one thinks she's warm. Still, Caspar invites her to dinner, and Rosalind appears to entertain the idea before lamenting that "there just isn't time" for such a thing.

As Rosalind considers the prospect of opening herself up to another person, she struggles mightily with what really doing so might mean. She wants to give Caspar the benefit of the doubt, but given how men have let her down, disrespected her, and preyed upon her in the past, she's reluctant to let him in. Even though the play has shown that Caspar's values are more in line with Rosalind's than the values of anyone else in her orbit, she's been let down before.

Crick and Watson succeed in unlocking the key to DNA's double helix structure, which in turn allows them to understand how DNA replicates itself through the templates provided in either strand. Crick and Watson begin dreaming of fame, money, success, and recognition, realizing how close they are to winning the "race."

Crick and Watson want to help humanity, to be sure—but this passage shows that they are more motivated by the prospect of science as a means to personal glory and professional immortality.

That February, Watson and Crick invite their colleagues from all over England to Cambridge. Rosalind, Wilkins, Caspar, and Gosling all pay them a visit. Rosalind is in a good mood—she flirts with Caspar, openly discusses theory with the other men, and even floats the idea of building a model. Crick and Watson ask Caspar how long he'll be in London, and he tells them his fellowship lasts only a couple more months. Rosalind says it's a "shame" that Caspar has to leave so soon. But Crick and Watson, realizing that Rosalind will be distracted from completing a model as long as Casper is in town, rejoice in having bought themselves some more time.

Time is the most valuable thing available to these scientists as they engage in a friendly but breakneck race to the top of their profession. Everyone celebrates Rosalind's burgeoning relationship with Caspar not because it makes her happy or fulfilled, but because it feeds their own selfish desires to get ahead.

Back in London, Rosalind and Gosling are at work in the lab—or, rather, Rosalind is hovering over their newest X-rays while she orders Gosling to stand away from her so that she can think. After some time, she says that the A and B forms have to be helical. Gosling steps forward from the scene, addresses the audience, and says that though Rosalind was just two steps from the solution, she couldn't see it.

This passage devastatingly hammers home just how close Rosalind was to winning the "race"—and how her own desire to protect herself ultimately hindered her professionally and personally in the end.

Hours later, Rosalind is alone in the lab staring at **Photograph 51**. Wilkins walks in and tells her she should go home and get some sleep. When Rosalind refuses, he offers to help her, but she retorts that she is at "the end of thinking" and feels her mind has gone blank. Wilkins offers to help Rosalind talk her thoughts through. After a moment of hesitation in which Gosling remarks that the "different ways [all their] lives could go hovered in the air," Rosalind says she'd like to call it a night. She leaves the lab.

Even this late in the game, Gosling suggests, Rosalind and Wilkins still could have overcome their differences and collaborated at last—if they had, they might have won the race, but it is impossible to know for sure given how things developed from this point on.

A few days later, in Cambridge, Watson and Crick are in a pub finalizing their theory. Meanwhile, in London, Rosalind and Caspar are at dinner together. Caspar thanks Rosalind for agreeing to eat with him and says he hopes he isn't taking up too much of her time. She tells him she's not sure how valuable her time is, and admits she believes she may have been "allotting it to the [wrong] things" lately. Caspar assures Rosalind that she's an amazing woman doing "groundbreaking work." Caspar acts Rosalind if her work makes her happy, and it's clear she doesn't know how to answer his question. Caspar says he has a theory that "the things we want but can't have [...] define us"—he asks Rosalind what it is she wants. Rather than answering truthfully, Rosalind says she's not sure.

Rosalind has chosen to put herself before her work—a choice that will cost her the winning of the "race" to uncover the structure of DNA. Rosalind is clearly conflicted about whether she should prioritize herself or her work—no matter what she chooses to devote her time to, she implies, she feels she's using it wrong. This tortured feeling is at the crux of the play's examination of time—there is never enough of it, and it is impossible for one to know, from the confines of mortality, whether one is spending one's time appropriately or evenly.

In Cambridge, Crick and Watson finalize their model at the pub. In London, Caspar takes Rosalind's hand—seconds later, she utters a painful gasp and doubles over. Wilkins steps forward. Science, he says, is "the loneliest pursuit in the world [...] because there either are answers or there aren't."

Just as Watson and Crick are on the precipice of winning the race and changing the world forever, Rosalind's life, too, is about to change. As tragedy looms, Caspar laments that the "answers" science provides often don't really explain the cruel twists and turns of fate.

Wilkins travels to Cambridge and examines Watson and Crick's model. As he does, Rosalind steps forward and announces, to the audience, that she has two large tumors—one in each ovary. Wilkins tells Crick and Watson that, to his great surprise, their model looks "exciting." Watson, shocked by the understatement, reminds Wilkins that what he's looking at is "the secret of life." Wilkins says he doesn't know if it is.

The excitement and sorrow contained in this passage both revolve around the biological origins of life and death. As Watson and Crick bring an understanding of the "secret of life" into the world, Rosalind confronts her death. Wilkins, so conflicted over everything he's done, finds himself overwhelmed by the banality of what they've discovered. Finding the "secret of life," he's realizing, doesn't really explain life after all.

Elsewhere, Watson and Crick examine their published findings bound in printed form. Crick seems uninterested and claims he's tired—Watson, on the other hand, is completely energized. He reminds Crick that now, they'll "never be forgotten." Crick, however, says that all he wanted was to "make some small difference." His wife, he confesses, has moved out, and he is alone.

While Watson was and is singularly focused on fame, renown, and professional success, Crick laments the ways in which his drive and hunger have impacted his personal life. The choices the men have made have changed the courses of their lives forever—for both better and worse.

Rosalind returns to her office from the hospital to find Wilkins sitting in the dark. He asks what she's doing out of the hospital, and she replies that if she's going to be in a "disgusting little room" it might as well be her laboratory. She says that wants to work some more before she dies. Wilkins asks Rosalind not to say such things, but Rosalind refuses to sugar-coat the truth to make it "pleasant." The truth, she says, is that in the end, humans all lose—"the work is never finished." Human bodies, Wilkins agrees, are like "grandfather clocks."

Rosalind and Wilkins bond in this scene over their shared grief—barely contained in both of them—over the ways in which time fails humans, decaying their bodies while they still live and keeping them from ever truly fulfilling their full potentials and possible destinies.

Rosalind asks if Crick and Watson's model is "beautiful." Wilkins tells her it is. She tells Wilkins that the two of them were close, at least. Wilkins laments that they "lost." Rosalind says the opposite is true: the whole world won. Plus, she says, it's not that Crick and Watson solved the puzzle first. She did—she just couldn't see it. With a few more days, she says, she might have.

While Wilkins takes a very male approach to the idea of having "lost" the race, focusing on his own individual failure, Rosalind takes a gentler approach—she appreciates that the race has been won at all and understands that the world will change for the better regardless of whose name is on the model, the prize, or the paper.

Rosalind then asks Wilkins why she didn't get those days. She wonders aloud if she didn't deserve them. She begins to wonder about the what-ifs of her life, and the other characters step in to provide them. If only she'd been careful around the X-ray beam, collaborated, been less wary (or perhaps more wary). Or, say Gosling and Crick, if only she'd been born at another time or as a man, she might have succeeded. Rosalind decides to stop dwelling on the what-ifs and happily announces to Wilkins that she's going to attend a conference in Leeds next month and do some traveling before and after.

An active scene and a choral address merge in this passage as Rosalind and the other characters lament the twists and turns of circumstance, choice, action, and fate that brought Rosalind's life down the path it ultimately took.

Gosling steps forward and says that Rosalind never went to Leeds—she died that April at 37 years of age. As he continues speaking, Wilkins begs him to stop. Gosling says he can't not report "what happened." Wilkins begs to "start again." Crick and Watson try to talk some sense into Wilkins, reminding him that his name is on the Nobel Prize. Wilkins, however, says the recognition is worthless and begs to start over.

Wilkins wants to start his and Rosalind's entire story over, just as he longed to start their partnership over every time something went wrong. Wilkins hasn't realized that his actions have consequences—and that he can't erase his unwitting errors in giving Watson and Crick the advantage in the "race."

Wilkins approaches Rosalind and says he has something to tell her. He confesses that on the day she went to see **The Winter's Tale**, he saw her go into the theatre. He got in line at the box office to buy a ticket so that he could go in and sit with her but decided not to. Now he wishes that he had done so, so that they could both have "experienc[ed] the very same thing."

Both Wilkins and Rosalind, this passage shows, had ample opportunity to make amends and show each other through gesture and action rather than word alone that they wanted a different, better relationship. Rosalind is not the only one who failed to collaborate—Wilkins here admits that he failed to meet Rosalind halfway and make their partnership more friendly and equitable.

Rosalind and Wilkins have a similar conversation to the one they had earlier in the play, quoting **The Winter's Tale** back and forth. Wilkins says that he loves the part where Hermione, killed by her husband Leontes, comes back to life at the end. Rosalind says that Wilkins has interpreted the play incorrectly—she doesn't come back to life, but instead, Leontes "projects life where there is none, so he can be forgiven."

This passage suggests that there is no way for Wilkins to repair the damage he has done to Rosalind's career. He may want to begin again and bring her (or at least her ideas and contributions) back to "life," but to do so, Rosalind declares, is impossible—it is childish, she suggests, to think any other way.

There is a point in life, Rosalind says sadly, where one simply can't begin again. Wilkins admits he has "spent [his] whole life in regret." Rosalind, smiling sadly, says that perhaps the two of them should have seen **The Winter's Tale** together, or gone to lunch. Wilkins asks if that would've changed things between them, but Rosalind doesn't answer him. Instead, she says she finds it strange that she can't remember the name of the woman who played Hermione. Wilkins laments that he can't either. "She simply didn't stand out, I suppose," Rosalind says, and the lights dim.

The play's final moments melancholically draw parallels between the obscurity of the actress who played Hermione and the obscurity to which Rosalind herself would be condemned in the years following her death. This illustrates that for a number of reasons—personal choices, professional setbacks, and uncontrollable twists of fate—Rosalind, like the actress who played Hermione, will not be remembered in the way she deserved to be.

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