Secret of Life:
Conflicting Attitudes Surrounding the Life and Work of Rosalind Franklin

History often attributes the discovery of the DNA molecule to Watson and Crick, though it often forgets the other key players: one of whom was Rosalind Franklin. Her work on the project was instrumental in the discovery of the DNA molecule itself, and one would be hard pressed to rebuke that. Yet there is still discussion around the character of Franklin herself, and while no one can deny that she was robbed of the recognition, there is conflict about what her relationship with Watson and Crick actually was, and what her role in the discovery was. She is painted as a feminist martyr, though this paper seeks to remedy that, and present her as a scientist whose work should be recognized for what it was: revolutionary.

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Rosalind Franklin has become one of a number of prominent targets of feminist theory, counting her among other historical figures whose thoughts and actions we tend to misinterpret to suit our own agendas. While she is lauded today as a type of feminist martyr, the case stands that she was also a product of her time and circumstances. The hope of this paper is to shed light on the inner workings of the King's College lab where Franklin had been working, drawing on accounts from both James Watson and Maurice Wilkins, and comparing those to what we know of her character today to form what is a more comprehensive reality. While her treatment at King's was, ultimately, a product of the misogynistic attitudes of the era, rendering her a victim of patriarchal systems, her reaction to said treatment can only tentatively be considered feminist in her contemporary context.

The foundational ideology within this text draws on the writings of Mary Wollstonecraft and Germaine Necker de Staël, both of whom can, at risk of imposing modern terminology on historical figures, be credited with perpetuating feminist theory. In Wollstonecraft's 'A Vindication of the Rights of Woman,'[1] the premise can be considered as recognizing women as equal in capacity to men, and that their achievements and intelligence noted as important because they are human, not because they are outstanding in a separate, gender-segregated social class. Similarly, de Staël proposes that women should be given the same intellectual opportunities and social and economic regard as men in her piece 'Literature Considered in Its Relationship to Social Institutions.'[2] In accordance with these particular feminist ideologies, we must first recognize that there are more factors at play in Franklin's experience beyond simple martyrdom,

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[1] Mary Wollstonecraft. "A Vindication of the Rights of Woman." *Norton Anthology of Theory and Criticism*, 2nd Ed. 2010.

[2] Germaine Necker de Staël. "Literature Considered in Its Relationship to Social Institutions." *Norton Anthology of Theory and Criticism*, 2nd Ed. 2010.

and this paper seeks to elevate her experience to that of scientist (not *female* scientist) while still communicating with the patriarchal and misogynistic notions of her time.

To further accentuate these ideas, the term 'radical feminism' can be applied in the sense that it works toward the root of an issue.[3] 'Root' implies discovering the truth behind a particular situation - here, the attitudes surrounding Rosalind Franklin versus the approximate truthful experience - and to be critical of pre-existing knowledge in circulation, because to be critical "is as inevitable as breathing."[4]

As the ideology presented has been used in the past to create the image of Franklin as a feminist martyr, it is only fair to employ it to justify her actions and situation as a product of the social attitudes of the 1950s, and attempt to create a comprehensive reality.

The notions surrounding traditional roles of men and women have changed significantly since the time of Rosalind Franklin. Yet while we would like to believe that we are far more accepting of women in the fields of science and medicine, we are only marginally better off than we were sixty years ago. According to Ruth Hubbard, "we live in a gendered society, and it should not surprise us if women and men tend to develop different tastes in the kinds of knowledge they seek and the ways they seek it."[5] This is, understandably, more true of the 1950s than it is in a modern context, though the stigma still exists. As a result of this ideological positioning, Franklin's choice to pursue a career in science during a period in which very few women would have elected for that particular branch of education has been marked as a highly

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[3] Voichita Nachescu. "Radical Feminism and the Nation: History and Space in the Political Imagination of Second-Wave Feminism." *Journal for the Study of Radicalism* 3, no. 1 (2009): 29.

[4] T. S. Eliot. "Tradition and the Individual Talent." *Norton Anthology of Theory and Criticism*, 2nd Ed. 2010. 956.

[5] Ruth Hubbard. "Science, Power, Gender: How DNA Became the Book of Life." *Signs* 28, no. 3 (2003): 791.

feminist decision. In some respect, perhaps it is. The issue lies in that this fact is taken out of context. Often in the study of history the lines between ordinary and political activity become blurred.[6] Historians, and even the general reader, will interpret data in certain ways as to fit a specific vision that they have, regardless of topic or subject. The combination of the study of Franklin's history and a modern feminist lens creates the image of a suppressed woman scientist, as well as a struggling but triumphant feminist.[7] Yet according to her sister Jenifer Glynn's account,[8] in conjunction with interviews with Francis Crick later in life, Franklin was simply a scientist who happened to be a woman, and only wished to be taken seriously in her field.[9]

That is not to say that Rosalind Franklin was *not* a feminist; she simply did not play the martyr she has become in modern times. In the twentieth century there was the theoretical (and *only* theoretical, mind) entrance of women into any scientific field they chose.[10] However, due to heavily reinforced gender stereotypes and myths upheld by the elite few, women, in practice, were still effectively barred from higher education by male-female gender enrollment ratios and their own unwillingness to suffer prejudice on behalf of their gender.[11]

Much can be said about Rosalind Franklin, and about her stubbornness and inability to release herself from a problem until she had solved it. Ultimately, however, she had a strong sense of morality and honour, and her sense of justice could at some times make her life far more

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[6] Barbara Green. *Feminist Periodicals and Daily Life : Women and Modernity in British Culture*. Cham, Switzerland: Palgrave Macmillan (2017): 1.

[7] Jenifer Glynn. "Rosalind Franklin: 50 Years On." *Notes and Records of the Royal Society of London*, vol. 62, no. 2 (2008): 253.

[8] Jenifer Glynn. *My Sister Rosalind Franklin*. Oxford: Oxford University Press (2012).

[9] Sarah Rapoport. "Rosalind Franklin: Unsung Hero of the DNA Revolution." *New York History* 84, no. 3 (2003): 321.

[10] Monique Frize. *The Bold and the Brave : A History of Women in Science and Engineering*. Ottawa: University of Ottawa Press (2010): 131.

[11] Frize. 145.

difficult than it needed to be.[12] It is her stubbornness that got her through her degrees in England and Paris, despite the possibility of being looked down upon for being a female scientist. That same sense of honour and justice honed her sharp wit against her colleagues, though we ultimately see this fail during her time at King's labs. What is remarkable about this failure is that London was far more gender segregated than the labs in Paris she had worked in.[13] This was one of the primary reasons for her tensions with Maurice Wilkins, a colleague and member of King's labs, who seemed to be the perfect candidate for workplace banter and soundboarding.[14] Whether Franklin self-identified with the early feminist movement, or to what degree she identified with it, is impossible to say in any accuracy without access to her own personal thoughts. As an interpretation of her biography,[15] however, as well as the thoughts of her sister,[16] it is quite likely that Franklin would had been an active supporter of the movement.

As a step away from Franklin herself, it is far more important to discuss the environment in which she worked during her time in London at King's. As mentioned above, the labs were very much gendered and considered to be an "old boy's club,"[17] to use the popular turn of phrase. As a result, while not overtly against having women working in the labs, it was difficult for many to stomach the thought of a woman working independently in the labs on her own projects, and not as an assistant. The two most prominent accounts, from James Watson and Maurice Wilkins, provide two very different takes on how Franklin was received.

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[12] Glynn. *My Sister Rosalind Franklin*. 10.

[13] Hubbard. 796.

[14] In academia especially, "soundboarding" as a concept is done by simply providing a listening ear to a friend or colleague who needs someone else to hear the problem in order for them to work through any difficulty they may be having by explaining it. It is also commonly referred to as being a "rubber duck."

[15] Glynn. *My Sister Rosalind Franklin.*

[16] Glynn. "Rosalind Franklin: 50 Years On."

[17] Wilkins illustrates in the first few chapters of his memoir *The Third Man of the Double Helix* that, while there was camaraderie, there was still gender segregation that was difficult to break.

It is important to note that James Watson had very little contact with Franklin throughout the course of the work on deoxyribonucleic acid (at the time, the popular acronym of DNA had not yet been coined, but will henceforth be referred to as such). He was stationed at Cambridge, alongside Francis Crick, and Maurice Wilkins and Rosalind Franklin were working at the King's College lab. Much of what he knew about her was a so-called accumulation of Wilkins's attitude towards her, stating that "clearly Rosy had to go or be put in her place,"[18] regarding her supposed hostility towards Wilkins for his own work in DNA study, and stating that "the best place for a feminist was in another person's lab."[19] We can see from Watson's account that Franklin and the man who should have been a close colleague did not get along, though to what extent we cannot be sure - while Watson frames it as an outright war, in Wilkins's account he seems distinctly self-corrective and remorseful of how he treated Franklin.

Yet despite Watson's comparatively little contact with Franklin, his attitude towards her would have been indicative not only of the period in general, but of the attitude towards women in science specifically as well. From what can be gleaned of Watson's personal character, he did not like being taught something by a woman (he had attended a lecture on DNA structure, which he found interesting, but promptly dozed off when he discovered it was Franklin herself giving said lecture, and not assisting a male colleague). Watson was far more contented with critiquing her clothing, lack of makeup, and stating that she "refused to emphasize her feminine qualities" rather than actually listening.[20] This resulted in, as one might suspect, his misremembering information and setting the design of a double-helix structure back by weeks, if not months, as he

[18] James D. Watson. *The Double Helix; a Personal Account of the Discovery of the Structure of Dna*. [1st Ed.]. ed. New York: Atheneum (1968): 17.
[19] Watson. 20.
[20] Hubbard. 797.; Watson. 17.

and Crick had dedicated their time to designing a structure based on profoundly incorrect information.

Watson's passive sexism accumulates in his presentation of Franklin in his autobiography *The Double Helix*, in which he creates a caricature who did not bow to male authority and refused to cooperate with her colleagues,[21] something that was evidently untrue. It would, had Franklin been alive at the time it was published, have also been bordering on libel.[22]

And yet there is *some* truth in his words, to an extent, and in fairness to Franklin's colleagues it is only right to at least mention it. We are aware, from her sister's account of her,[23] that Franklin was strong-willed, self-reliant, and had a firmly set sense of honour and justice. These traits laid the groundwork for how her relationship with Wilkins would become characterized. Franklin was under the assumption, in her introduction to King's, that she would be working on DNA structure alone, rather than with Wilkins and his assistant.[24] The miscommunication was never remedied, though both she and Wilkins handled it incorrectly by not soliciting the department head immediately to get the matter clarified. Instead, Franklin was left feeling slighted by Wilkins's continued work on what she deemed her own project. The resentment and lack of communication only grew, and fueled by her temper, Franklin thought his work a continuous affront. Wilkins mentions multiple times in his own memoir, *The Third Man of the Double Helix*, that he should have done something in order to rectify the issue, but his

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[21] Hubbard. 798

[22] The outright slander that *The Double Helix* includes, had it been published during Franklin's lifetime, would have been sufficient enough to effectively oust Watson from scientific and academic circles.

[23] Glynn. *My Sister Rosalind Franklin*.

[24] Ibid. 119.

respect for her as an authority on x-ray crystallography pushed him to hope that it would "all blow over" if he ignored the tense atmosphere.[25]

Wilkins characterizes the lab in which Franklin arrived as creative, non-hierarchical, and democratic,[26] and that the atmosphere was conducive to the various projects they were conducting. Yet, as many labs in England were during the early to mid-twentieth century, women were barred from staff common areas where the men took coffee and lunch. This effectively excluded them from the camaraderie that should have been extended to every member of the staff. We cannot, however, attribute this misogynistic attitude to Wilkins in its entirety. While he himself may have found no personal issue with the way the lab relationships were conducted, and would have, due to the social climate of the period, likely made little effort to change it, he was the one who pushed for Franklin to be moved to the DNA program rather than her original protein assignment.[27] Wilkins did so knowing that Franklin's talents with x-ray machines would be best utilized on the structure project he himself was working on and would have appreciated another mind to work alongside. He was, however, under the assumption that they would be working together,[28] rather than her taking over leadership, which resulted in the animosity we see commonly repeated in scholarly work surrounding the pair.[29]

Wilkins did not, however, bear Franklin any lasting ill will, finding her intelligent and "pleasant to talk to," if somewhat prickly, before her shift in attitude that was a result of the

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[25] Maurice Wilkins. *The Third Man of the Double Helix : The Autobiography of Maurice Wilkins*. Oxford: Oxford University Press (2003): 143.

[26] Ibid. 101.

[27] Ibid. 128.

[28] Julie Des Jardins. *The Madame Curie Complex : The Hidden History of Women in Science*. Women Writing Science. New York: Feminist Press at the City University of New York (2010): 183.

[29] Michelle G. Gibbons. "Reassessing Discovery: Rosalind Franklin, Scientific Visualization, and the Structure of DNA*." *Philosophy of Science* 79, no. 1 (2012): 63-80. Gibbons states that the work on the A form of DNA was given to Franklin and the B form to Wilkins, though this account only adds to the confusion about who was leading the project, should the article be reliable.

department head's poorly communicated project outlines.[30] His presentation of their relationship, as we can see, is obviously very different than how it is illustrated in Watson's *The Double Helix*, in which he states that Wilkins's life with Franklin was nothing less than an "emotional hell."[31] The account itself is likely self-corrective in some form, and when read thus it communicates a desire to atone for what could have very well been poor treatment of his colleague. With that said, the information presented in it is quite possibly closer to the truth than Watson's almost-fiction. Because Wilkins does not have the same overtly sexist tone in his attitude or writing, though he admits that he was juvenile in some cases,[32] it is clear that gendered attitudes were not the prevailing cause behind how Rosalind Franklin was treated in the labs while she worked at King's, but rather a result of gross misunderstanding and miscommunication.

If we can assume with moderate surety that Franklin's treatment at King's was a product of the times but on the whole professional, the next major argument is how to approach the use of her work in the creation of the double-helix form. She was, as Wilkins repeatedly states, the foremost authority on x-ray crystallography, a process that involves removing the DNA from a cell and converting it into crystal form, and then using a specially-designed camera to photograph a negative image.[33] We also know that her work was fundamental in allowing Watson and Crick to develop a model form of her images, a scientific milestone that can be found repeatedly credited to both men in high school science textbooks as well as articles that

[30] Wilkins. 132.
[31] Watson. 167.
[32] Wilkins. 133.
[33] Rapoport. 319.

circulate in academia.[34] But the question that has raised ire among the modern scientific and feminist communities is the circumstances surrounding how they acquired the photograph to begin with, and why she was not credited with the findings.

The question of the photograph is a relatively easy one to solve, shrouded in mystery though it is. Nearing the end of her three-year term at King's, Franklin was required by the head of the department to finish up her work to the best of her ability and pursue another project when she moved to a different lab. She had been close to finding the DNA solution, the only obstacles standing in her way was how to decipher whether it was a helical structure, and how the internal molecules were organized (which would have made one answer clear over all others). Among her work there was a photograph - the famous, or perhaps infamous, *photo 51* - which clearly showed evidence that DNA was actually helical in structure.

There are conflicting accounts as to how Wilkins managed to become proprietor of this information - the first being that he stole it and had in fact been attempting to sabotage her progress.[35] The second account is from Wilkins's own writings. He states that he was given the photograph by Franklin's grad assistant, now under the assumption that the project was now being given entirely to him, and that he was free to do with it what he pleased as Franklin herself was preparing to leave.[36] Due to the circumstances of Franklin's departure, it is likely that Wilkins was, in fact, given the photo, and that because he bore Franklin no malice or ill will, it

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[34] Soraya De Chadarevian "Portrait of a Discovery: Watson, Crick, and the Double Helix." Isis 94, no. 1 (2003): 90-105.; M. Bhargava Pushpa. "Crick, Watson and DNA: A Personal Salute." *Economic and Political Weekly* 38, no. 51/52 (2003): 5338-341. In 'A Personal Salute,' Franklin is only mentioned twice, in passing, neither of which gives her credit for her discoveries or work done on the project. According to 'Portrait of a Discovery,' the credit given to Watson and Crick came at the expense of other participants, and states that Harvard University Press refused to publish Watson's *The Double Helix*, claiming it as an embarrassment to academia. Neither of these things seem to factor in to how the events are narrated.

[35] Rapoport. 324.

[36] Wilkins. 198.

can only be supposed that his showing the image to Watson was only out of a sincere desire for inter-lab collaboration.[37]

The second question, the simple fact of Franklin being excluded from credit for her work, is harder to answer. Franklin had few, if any, sincere friendships during her time at King's, and as a result even fewer people who would have interceded on her behalf had something gone awry.[38] Maurice Wilkins, the one man above all who should have used his power to correct the mistake, did not. The blame is not on him entirely, as we have discussed, though it is recognized that he could have done more to help her, even if at the time he misunderstood the problem at hand. The slight against Franklin is merely a product of the times, in which women faced a great deal of social prejudice when attempting to navigate the academic hierarchy,[39] often on their own and without help. So while Franklin was not (with perhaps the exception of Watson) a victim of openly misogynistic attitudes towards her person, it was more the deeply rooted patriarchal institution that facilitated her fade into obscurity in the years between her death and the present.

It has often been argued that had Franklin been male, she would never have been forced to leave her work behind her, and Wilkins would never have been given custody of it. The fact of the matter remains that despite the circumstances surrounding it, Watson and Crick violated academic honour codes by refusing to credit Franklin and dismissing her work, ultimately robbing Franklin of the recognition that her male colleagues shared.[40]

It can be argued that Rosalind Franklin is a type of feminist martyr, though as we can see from the accounts given it is difficult in reality to position her as such. She did struggle, yes, and

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[37] Wilkins. 173.
[38] Des Jardins. 185.
[39] Frize. 132.
[40] Rapoport. 325-6.

she faced as many challenges as any other woman in her position in the 1950s, but she was also a unique case. She was brought to King's because she was the foremost authority at the time on x-ray crystallography, and that won her at least some respect from her colleagues. The lack of inclusion in social circles can be attributed to sexist attitudes, but that in and of itself cannot be considered an outlier, as it still occurs today in modern STEM labs.[41] This could also, as has been noted, be written down in part to her attitude towards "dishonourable treatment" - if Franklin felt she had been offended in some way, it is possible that she would have ignored the society of those who had offended her. It is the conflicting accounts of James Watson and Maurice Wilkins that shed light on her situation. Watson's account of her makes her seem shrewish, fiercely independent to the point of starting fights where none exist, and so aggressively feminist that no one would wish to speak to her.

How much of this is true? If we take into account that women today have to work harder than their male counterparts and are characterized similarly to Franklin, it is both completely true and completely false. Wilkins, while admitting that he could have done more to rectify the issues as they arose, agrees with Crick's assessment that she only wished to be taken seriously. It was Watson and Crick's blatant disregard for Franklin's work in their Nobel acceptance speeches that highlighted the misogynistic attitudes of the time. Their academic erasure further proves that, in conjunction with the patriarchal systems prevalent in science labs in the twentieth century, while

[41] Gendered segregation of science begins early, even in the twenty-first century, as can be seen in marketing advertisements. Girls, particularly between the ages of eight and thirteen, are often subliminally encouraged to pursue paths related to appearance and the home. Boys of the same age, on the other hand, are proactively encouraged to engage in science and exploration, and are often directed towards mathematics and, most often, chemistry and physics. This, as one may suspect, affects children's attitudes towards STEM education, and research studies often place an upper cap of female involvement at thirteen to twenty percent in mathematics-based fields, particularly physics, despite differing time periods. Though it often goes unnoticed, sexism in the realm of science has become ingrained in the field, and to such a degree that women like Franklin, who achieve success in some fashion, are both outliers and outcasts.

Rosalind Franklin did not suffer herself at the hands of the institution, her academic advancement and recognition was denied as a result.[42]

History is, as can be noted even by marking recent events, subject to interpretation. Judging the events of the past through one specific lens makes for a limited view, and can lead to wildly conflicting stories, as we have seen. But the real question, the one on which we will end, is whether or not Rosalind Franklin could have, on her own and uninhibited by patriarchal institutions and ideologies, discovered the structure and form of the double helix, and thus the way in which genetic material is transferred - in other words, the "secret of life." She very well could have, but we can never know with surity how close she came or would have gotten if circumstances permitted. We are limited in scope and ability due to our position in time, removed as we are from the events of London in the 1950s. We can, at best, speculate the truth from history that has already been written.

[42] Franklin went on to do important research in other scientific branches, though it is her breakthrough in DNA that she is the most known for, particularly among feminist historians.

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