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Strangers in Togetherville – Women, Physics and Popular Culture

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By drawing on Jean Baudrillard's cultural theory this paper aims to show how contemporary popular culture tells the stories of scientifically talented women of the past. In the course of my argument, I refer to books and films set in the past and focus on the women-and-science motif. Firstly, the stories of individual female scientists living long ago are analysed (Mileva Einstein, Joan Clarke), then, the collective female protagonists – wives of scientists living together in "togethervilles" (Los Alamos, Atomic City), and women scientists pictured in speculative fiction – are discussed. The clichés used in these texts – lonely forgotten geniuses, female worthies taken advantage of, ostracised women accused of not being feminine enough and devoted wives who help their men and their countries in World Wars I and II or the Cold War – reflect ideologies that Western culture used to believe in. Conversely, the two original presentations of past female scientists that I found both come from speculative fiction concerned with science and heavily influenced by the ideologies of science: science and pacifism, science and a sense of guilt, and science as a weapon in the quest for democracy and freedom.

Keywords
Women-and-science; Los Alamos; Atomic City; Mileva Einstein; Joan Clarke

Traditionally, the standard way of depicting the women-and-science motif has been that of the Shaman's (or the Professor's, or the Magician's) daughter. Miranda, the daughter of Prospero in Shakespeare's *The Tempest*, is an archetypical example: she grows up surrounded by her father's mysterious "books" and is manipulated by his magic. Yet, she does not try to read his

books or learn magic. Instead, she happily lets Prospero arrange everything for her, including a suitable marriage. The eponymous Rappaccini's daughter in the famous Gothic tale by Nathaniel Hawthorne is another romantic incarnation of the archetype, as are the numerous professors' daughters of E.T.A. Hoffmann's stories.

In the past four decades, the women-and-science motif has been repeatedly used in blockbuster science fiction films, especially those set in the contemporary United States. In these productions, however, women are scientists rather than scientists' girlfriends, wives or daughters. Interestingly, this does not necessarily mean that they are no longer "damsels in distress" in need of rescuing; nevertheless, recent cinematic portrayals of female scientists have definitely changed.[1] The first female character in a science fiction film who is both feminine and a fighter is probably Ripley, the astronaut played by Sigourney Weaver in Ridley Scott's 1979 classic, *Alien*. Thanks to her determination and level-headedness, she alone survives the alien-infested starship Nostromo. In fact, had her male colleagues listened to her, the whole crew would have been far better off.[2] The feminine, but invincible, Ripley in *Alien* became iconic. In fact, over the next few years, Weaver was cast as a brave female scientist in several films. In 1998, she starred in *Gorillas in the Mist: The Story of Dian Fossey*, directed by Michael Apted, which presents the true story of a primatologist whose crusade to protect mountain gorillas in Rwanda led to her death.[3] Fossey's complicated private life is depicted on screen, but it is her determination to study and protect the disappearing rare species that makes her special. Similarly, in James Cameron's *Avatar*, Weaver plays Dr Grace Augustine, a xenobiologist who is able to sympathise with an alien eco-system and who dies protecting it. In both cases, Weaver plays a strong but motherly figure who fights to save her charges.

Generally, the female scientists in recent science fiction films are depicted as capable of understanding the unknown – sentient alien beings included – specifically because they are women. Examples of this trend can be found in *Scott Derrickson's 2008 The Day the Earth Stood Still* and *Denis Villeneuve's* 2016 *Arrival*. In the first, Jennifer Connolly plays xenobiologist Dr Helen Benson; in the latter, Amy Adams plays linguist Dr Louise Banks. Both films also employ parallel plots: Connelly and Adams simultaneously play terrestrial scientists summoned to communicate with alien invaders and mother-figures who must cope with the most difficult aspects of maternity – bereavement and step-motherhood.[4]

All the examples of female characters mentioned above come from recent

American films and are part of popular culture; they are meant to be watched by people who accept the equality of the sexes and live in societies in which girls are encouraged to study STEM subjects and are not discriminated against in their schools. Therefore, one can risk generalising that at the end of the 20th century and the beginning of the new millennium, a new stock protagonist in science-oriented film genres emerged. This new character is a female professor whose gender is far less important than the scientific research she conducts into unknown cosmic phenomena. The setting of these narratives is "now" or the "near future" when numerous women succeed in science and technology, and no one is surprised. However, this change in approach to the subject of women and science in recent popular culture does not transfer to stories set in historical epochs or those focused on real women in the past. Rather, a set of stereotypes still emerges. A talented female scholar in popular science narratives set in the early 20th century is most often an unknown female genius taken advantage of by male scientists, or a pretty girl whose brains are less conspicuous than her looks and who hides her intellectual potential to avoid social ostracism, or a devoted wife sacrificing her ambitions to secretly help her scientist-husband in his research.

What I aim to achieve in this paper is to show how contemporary popular culture tells the stories of scientifically talented women of the past. By contemporary popular culture, I mean the modes of mass entertainment of Anglophone Western civilisation: post-1990 books, films, press and websites, created by and for people who speak English (mostly but not necessarily as their first language) and share the values of Western democracies. In the course of my argument, I refer to generically disparate works: essays, TV shows, books and films set in the past and focussed on the women-and-science motif. Firstly, the depictions of individual female scientists living long ago are analysed, then, the collective female protagonists – wives of scientists living together in "togethervilles", and women scientists pictured in speculative fiction – are discussed. The paper aims to prove that the authors of these texts try not to write historical fiction but, paradoxically, simulate "real" history. This reversion recalls Jean Baudrillard's theories.

> There is no more double; one is already in the other world, another world which is not another, without mirrors or projection or utopias as means for reflection. The simulation is impassable, unsurpassable, checkmated, without exteriority. We can no longer move 'through the mirror' to the other side, as we could during the golden age of transcendence. (Baudrillard 3)

The above quote comes from "Simulacra and Science Fiction", an essay Jean Baudrillard included in his famous book *Simulacra and Simulations* (1981), where he describes the new type of fiction written in the times of simulacra. We live in a world so deeply infiltrated by reflections, copies, utopias that there is no "real" to transcend in fiction. In a way, we already are inside fiction, which makes the role of a writer, especially a historical fiction writer altogether problematic.

Female Einstein

In her essay, *A Room of One's Own*, Virginia Woolf famously asks what would have happened to "Shakespeare's Sister", as talented as her brother, if she had been born in the 16th century. Similarly, ideologically-minded contemporary critics often ask about women in the past who were born with the talent and genius of Newton or Einstein: What happened to them? Why do we not know their names?

Perhaps the most extreme example of late 20th-century journalists drawing attention to a never-recognised female genius is the affair surrounding Mileva Einstein-Marić. The first wife of Albert Einstein, Marić was not only a woman interested in science but also of the Serbian Orthodox faith, making her a paragon of this persecuted minority in the Austro-Hungarian Empire. Despite many obstacles, she managed to become a student of mathematics and physics at the University of Zurich, where she met Einstein. Having failed the final examinations due to poor marks in mathematics, she never received her diploma and never became a high school teacher of physics as she had planned. The couple married and had two sons. During the years when Einstein was writing his most famous papers, Mileva Marić discussed his ideas with him (or, as other critics claim, listened to him passively) and helped him with the papers, perhaps editing them, perhaps copying passages or checking calculations; again, opinions vary. Finally, the marriage fell apart. Einstein obtained a prestigious post in Berlin, obtained a divorce promising Mileva Marić and their sons all the money from the Nobel Prize he was sure to get, and re-married a wealthy Jewish widow – his distant cousin Elsa Einstein. When Hitler took over Austria and the Nazis made life difficult, the Einsteins emigrated to the United States, where they stayed to the end of their lives. Mileva Marić died in Europe in 1948.

Her story surfaces every ten years or so and is described anew by some journalist who believes she co-authored her husband's theories. After each publication, the historians of science disprove the thesis, but once Mileva Marić's story is forgotten somebody else comes across the same pieces of evidence and again publishes or produces a documentary on her. The controversy started at the turn of the 1990s, when Einstein's letters to Marić were translated into English and published by Princeton University Press as *Albert Einstein, Mileva Marić: The Love Letters* (1992). In one of the letters from 1901, Einstein writes about "bringing our work on relative motion to a successful conclusion" (Einstein, Marić letter 25). This sentence, particularly Einstein's use of the pronoun "our", caused several people to speculate as to what extent Marić helped formulate the theory of relativity.

In 1989, Evan Harris Walker published a letter titled "Did Einstein Espouse his Spouse's Ideas?" in *Physics Today* in which he writes, "I cannot help but see Mileva and Albert working together to achieve the kind of husband and wife recognition that has come to Marie and Pierre Curie" (10). Both Mileva Marić and Maria Skłodowska were well-educated Slavs who married foreign scientists, yet Skłodowska continued working after her husband's death and received recognition. Mileva died in obscurity, though to some critics she is "The Woman Who Did Einstein's Mathematics" as the title of Senta Troemel-Ploetz's paper published in 1990 in *Women's Studies International Forum* suggests. Most critics who compare Marić to Skłodowska cite as their source Abram Fedorovich Joffe's paper from 1955, which was published in Russian in the Soviet journal *Uspekhi fizicheskikh nauk*. Joffe worked as Wilhelm Conrad Röntgen's assistant from 1902–1906 and allegedly heard Röntgen say that Einstein's papers of 1905 had initially been signed with both spouses' names. Yet this claim repeated in many feminist papers, largely results from a mistranslation or selective translation of Joffe's memoirs. The relevant passage states:

> For Physics, and especially for the Physics of my generation – that of Einstein's contemporaries, Einstein's entrance into the arena of science is unforgettable. In 1905, three articles appeared in the *Annalen der Physik*, which began three very important branches of 20th century physics. Those were the theory of Brownian movement, the theory of the photoelectric effect and the theory of relativity. The author of these articles – an unknown person at that time, was a bureaucrat at the Patent Office in Bern, Einstein –

> Marity ... Marity – the maiden name of his wife, which by Swiss custom is added to the husband's family name. (www.teslasociety.com/theoryofrel.htm)

"Marity" is the Hungarian form of the Serbian "Marić" and the relatively unknown early 20th-century Swiss signing convention caused people who saw the translation of the above passage, without the additional explanation in brackets, to jump to hasty conclusions. As recently as 2003, Oregon Public Broadcasting and the Australian Broadcasting Corporation co-produced the documentary *Einstein's Wife*, which repeats all the key points Mileva Marić's defenders make: the use of the phrases "our theory/our work" in Einstein's love letters, Röntgen's words to Joffe and the passage from Joffe's article devoid of the information in brackets, comparison to the Maria Skłodowska-Pierre Curie husband-and-wife team, and the fact that Einstein gave Mileva Marić all the money from the Nobel Prize in their divorce settlement.

Making Mileva Marić the silenced genius fits the "woman behind the scenes" pattern perfectly and may seem medially, politically and patriotically attractive; thus, despite all the evidence to the contrary[5] the story re-surfaces every few years. According to Jean Baudrillard's *Simulacra and Simulation* media are responsible for producing the greatest amount of simulacra, and TV networks penetrate deep into social structures infiltrating all spheres of life and shaping mass culture. Contemporary society reflects TV (nor the other way round) and the postmodern subject, "the citizen", is constituted by watching TV which provides him or her with the socially shared vision of reality. The televised story of Mileva Marić proves his point.

Women worthies

One may even say that the talented, but looked-down-upon female scientist, has become a stock character in modern fiction and non-fiction dealing with science from before the Women's Liberation Movement. An example of how visual media further simplify such biographies can be found in the story of Joan Clarke, a cryptanalyst and a very talented mathematician who worked at Bletchley Park during World War II. Clarke was a scholarship girl who studied in Cambridge and graduated with a double first degree in mathematics. She was denied the full degree (which until 1948 could only be given to male students), yet her academic supervisor recruited her to the

Government Code and Cipher School. In 1941, she found herself in Bletchley Park, where she became the only female senior cryptanalyst, but, because a woman could not formally work in that post, she was officially classed as a linguist ("grade: linguist, languages: none" the Bletchley record states). As a result, she was paid less than her male colleagues. She protested in vain but spent all the war years at Bletchley, and after the war she continued to work there as a mathematician.

In the late 1970s, Andrew Hodges, a professor of mathematics and an activist in the Gay Liberation Movement, became fascinated with the mysterious figure of Alan Turing, Clarke's boss at Bletchley and the genius who broke the Enigma code. Turing's death in the early 1950s is thought to have been the result of suicide, and for half a century his story was top secret as the Enigma files were classified. Hodges did thorough research on Turing and published an extensive biography in 1983: *Alan Turing: The Enigma*. In one chapter he writes about Joan Clarke, a very talented member of Turing's team to whom Turing proposed. She accepted, but after a couple of months Turing broke off the engagement because of his homosexuality. The two remained friends for life and shared a passion for chess.

In 2014, Morten Tyldum directed *The Imitation Game*, a film adaptation of Hodges's book. The screenplay, by Graham Moore, was awarded an Academy Award, yet Andrew Hodges complained it "built up the relationship with Joan much more than it actually was". In the film, Joan Clarke is a young woman whose parents disapprove of her brains and academic career, finding it "indecorous". The fact that she is prevented from becoming a fellow at Cambridge because of her gender is mentioned but in passing, and we do not learn at all about her being paid less or being classified as a linguist. The film focuses instead on the social conventions and stereotypes that make Joan Clarke stand out in many men-only situations. When she tries to enter the examination hall to be tested for a position at Bletchley (in the film she is not sent there by her academic supervisor but instead finds the job offer in a newspaper), everybody directs her to the secretaries' section. When she writes the test brilliantly and hands it in first, everybody thinks she has found it too difficult to even try. Her parents worry about her being twenty-five and unmarried and refuse to let her go to Bletchley (all of which was added by Moore). Finally, Turing proposes to her to help her meet social expectations and her engagement makes her family happy. The regulation forbidding men and women to work as equals is mentioned, but only in jokes at the pub where male cryptanalysts and female secretaries meet. Joan lives with other girls at

the secretaries' lodgings and Turing visits her secretly at night, bringing her the Enigma printouts she helps him decode. Much is made of the fact that he enters through the window – not because of the security breach but because she is a decent girl who does not entertain boys so late. After the war, when she pays him a visit during the last days of his life, we see Joan as an elegant young woman who has managed to secure herself an academic job and is happily engaged to a more suitable fiancé. Generally, the Joan Clarke in *The Imitation Game* is a pretty, insecure girl who is aware of her extraordinary intellect, but reluctant to resign from the standard British, middle-class life of a housewife. Although she enjoys her little victories over her less talented male colleagues, she is far from radicalised. The film focuses on Turing and his tragic biography and the Joan Clarke subplot only appears to be blown out of proportion: instead of telling her story it turns it into a clichéd "brainy girl in a male world" narrative. Without denying her role in solving the Enigma code, the film does not claim that she was a principal figure in the Turing team, nor does it suggest that her achievements were diminished by her colleagues because of her sex.

For more complex pictures of female scientists, we can look to Thomas McMahon's *The Principles of American Nuclear Chemistry: A Novel*. The book describes people whose research helped develop the theory behind the atom bomb. Although most of the scientists depicted are men, there is at least one woman of extraordinary talent and intellect in the novel: Leona Woods. By the late 1930s, when nuclear physics was no longer confined to university labs and lecture halls but had become an important factor in the coming war, Woods, an extremely talented American graduate student, was very young. An assistant of émigré Enrico Fermi and a friend of his wife, Laura, Leona Woods socialised with the nuclear physicists and chemists who she later joined on the Manhattan Project. In the early 1940s, she married one of those physicists and became Leona Marshall. During the war years, she worked in both Atomic City and Los Alamos. She wrote diary entries recording ground-breaking discoveries and describing the people who made the atom bombs. Leona Marshall Woods is remembered by the Fermis on the day they met her as "still a graduate student, twenty-two and shy" (Rhodes 248). In Thomas McMahon's *The Principles of American Nuclear Chemistry: A Novel*, her name is changed to Selina Meisner, but her true identity is easy to guess. The teenage narrator, a boy who goes to Los Alamos with his nuclear chemist father, remembers her as beautiful, shy and delicate. It is she who first suggests to other scientists that the bomb they are constructing may set the atmosphere on fire and, once the chain reaction

starts, it might be unstoppable and cause the earth to explode. During one of the formal weekly seminars at Los Alamos, she writes her calculations on the blackboard: "Selina standing to one side passed by the emotional rush. People doing their own independent calculations on the backs of envelopes, corners of the blackboard. Selina drinking coffee" (McMahon 213).

For the boy, just a few years younger, it is as if Selina embodies the spirit of the time, the latent fears and the ambitions of the older men she works with. In the eyes of the male beholder, she definitely does not belong with the wives of Los Alamos, though she is married to one of the scientists. Her serenity and beauty make her highly visible; she is an individual, they are just the backdrop. Selina/Leona's case is unique. In the male novelist's account, her talent makes her different than the other "Atomic City" girls and, although she does participate in the war effort with them, she is definitely not one of them. The stories of these women who lived and worked in Los Alamos and Bletchley Park simulate the wartime reality in a Baudrillardian fashion: "today one has the impression that history has retreated leaving behind it an indifferent nebula, traversed by currents. It is into this void that the phantasms of a past history recede, the panoply of events, ideologies, retro fashions" (Baudrillard 43–44).

Togetherville

Some recently published popular science books focus on the wives of key players in well-known events such as the Trinity explosion and the Moon landing. They document the little-known stories of the female communities behind these largely male achievements. Lily Koppel's *The Astronaut Wives Club: A True Story* (2013) is devoted to the wives of NASA astronauts who were forced to settle their families on one isolated estate in Houston, Texas. Denise Kiernan's *The Girls of Atomic City: The Untold Story of the Women Who Helped Win World War II* depicts the female inhabitants of Oak Ridge, Tennessee (also known as Site X). This was the secret village near the Clinton Engineer Works where uranium and plutonium were processed during the war to meet the needs of the Manhattan Project. TaraShea Nesbit's *The Wives of Los Alamos* is a semi-fictional account of the lives of women whose husbands worked in the secret labs in Alamogordo from 1943–1945. Set in unique places at very precise moments in history, these books blend fiction and non-fiction to tell the stories of individual women who were historically speaking real, though not

significant enough to find their way into the official records. The emphasis in all three texts is put on the feeling of togetherness in these female communities. These women who were brought together by sheer historical accident felt estranged from their over-worked husbands (who were forbidden to discuss their top-secret jobs with their families) and turned to each other for help and support, overcoming prejudices of class, ethnicity and education.

These books are interesting for several reasons. They tell a story of being proud of one's country and participating in the war (or the Cold War) effort, and they profit from the current nostalgia for the fashions of the 1940s and 1960s. They also adopt the point of view of the silent minority (from the days before the Women's Liberation Movement) and of the Other (as female stories are contrasted with the dominant male point of view). The authors give voice to those previously ignored, whom the mainstream textbooks mention but in passing in their treatment of WWII. All three female communities lived in the shadow of great scientific and political events: Oak Ridge and Los Alamos housed the greatest physicists of their time, while the American space programme was the greatest example of the application of modern astrophysics to propaganda and political goals. I intend to show how Koppel, Kiernan and Nesbit deal with the paradox inherent in their projects: how they depict the communities of the wives of men engaged in scientific endeavours, endeavours in which a few female scientists also participated and worked with these other women's husbands. Were these female scientists part of the wives' communities? Or were they strangers in Togetherville, considered not feminine enough to share the experience of the women-behind-the-scenes? Are we dealing with a case of "reverse discrimination"?

Interestingly, women such as Leona Woods are strangely absent from these writers' non-fiction works about the female communities of the Manhattan Project or the Apollo and Gemini missions. Did they not cook? gossip? need support? have their hair done? suffer a shortage of everything? Perhaps more important than their gender is the fact that they were given access to classified information, whereas, central to the "women behind the scenes" experience is the fact that they are participating in something they are not allowed to understand. An interesting question would be whether this knowledge came at the price of being excluded from the female community, of being cast out of Togetherville.

In TaraShea Nesbit's *The Wives of Los Alamos*, a first-person plural narrator recounts the collective experience of the women living in the New Mexican desert with their nuclear physicist husbands. The wives remember the

Manhattan Project: how upon arriving at Los Alamos they did not know what kind of work their husbands performed at the labs. The women were mostly very young with small children, and their husbands were in their early thirties. Surrounded by the desert and made to live in poorly equipped barracks, the wives were apprehensive: their letters home were censored; their husbands were "no longer Doctor or Professor, but Mister" (Nesbit 41) and made to wear badges: some wore white ones (they knew what was really going on in the labs), and some wore blue (they only knew what they needed to do their job). The wives could not enter the Tech Area and from time to time they were asked by their husbands to invite some people to dinner. Arriving on the porch, the guests would say "Congratulations!" to their husband, but none of the wives knew why. The husbands disappeared into the Tech Area for hours, sometimes dragging with them an army cot and the wives could not ask questions, not even how their day was. The wives missed their mothers and friends: they wanted somebody to watch over their children, somebody who would console them and give them time to have a shower or a walk. Most of the wives arrived in Los Alamos with their children before their husbands and found only empty houses with ugly rooms: "It was stuffy inside but we could not open the windows because they were painted shut. We were disappointed or angry but when we entered our apartment we found a vase of wildflowers on the kitchen counter, a pitcher of milk in the icebox, and a note 'Welcome to the neighbourhood! – Katherine & Louise'" (21–22).

The wives started to help one another and to talk to one another, friendships were made, and finally, all of the women felt better. Having someone to talk to and to share doubts and anxieties with, someone also kept in ignorance, was comforting. They loaned the few dresses they had brought with them to the desert to each other and their shared wardrobe lasted them three years. They also conspired to stop wearing decorative hats and delicate stockings, and all of them, even the professors' wives, wore blue jeans to parties. Any newcomer was immediately recognised by her heels getting stuck in the mud or sand. Sometimes, the wives were hired as secretaries and calculators since they were around and, moreover, having screened the whole family, the army was sure of their moral backbone and political sympathies. Peeking into the labs, they were disappointed as the "mystery and glamour we'd fabricated was instead a dirty, cluttered, overcrowded mess" (65).

Denise Kiernan's *The Girls of Atomic City* depicts similar feelings of togetherness, sacrifice and pride. The protagonists are the women who accompanied their husbands to Oak Ridge, were recruited to perform simple

menial tasks there, or both. Few, if any, of the women were aware that what was being done there led to the atomic bomb. Kiernan stresses the dirt, the mud, the bad weather, the shortage of everything and the military atmosphere of the place. Atomic City looked like a shanty town-cum-war camp. Very young women were brought from all over the country knowing that they were to work and to not ask questions. They abandoned their families, their parents' farms, or their high schools and entered factories and offices and were told that they were participating in the war effort. They lodged in boarding school-like dormitories; married couples were given a separate room in the barracks if they were white (black couples were separated). Most of the single girls had fiancés at the front, they all missed their mothers and quickly made friends with their roommates. They helped each other, covered up for each other, and borrowed each other's dresses to go out. They celebrated the end of the war together and they were all shocked to learn about the Hiroshima and Nagasaki bombs they had helped to produce. Kiernan's message is that the girls of Atomic City were only able to survive, mature, and help America win World War II because of the support they gave each other.

The wives described in Lily Koppel's *The Astronaut Wives Club* live in an isolated district of Houston in pleasant estates of small houses with gardens which they nickname Togetherville. They arrive there overnight when their husbands are selected to participate in the Mercury, Gemini and Apollo missions. The American government decides the astronauts' families should live in the same place for security and propaganda reasons. Togetherville is easy to control and protect against infiltration by "the Reds", and the township is made into the perfect example of happy, patriotic, middle-class American family life: fair-haired children, elegant wives, and smart muscular husbands who boldly go into outer space to show how great their country is. It is not accidental that out of the approximately sixty American astronauts of the period, only one was unmarried and none gay. All the astrowives were, or seemed to be, patriotic with no story of previous marriages or college-age communist fascinations in their pasts. In the process of selecting future spacemen, an applicant's family situation was taken into consideration and an unsuitable wife was enough to get one disqualified. Togetherville was often photographed by government recruited photographers (the photographs were published exclusively in *Life* magazine), and filmed and described in the press (again, the reporters were carefully chosen and controlled). During lift-offs and landings, impromptu TV studios were placed in astrowives' gardens and stations reported live on how they were coping.

The women were essentially housewives. They had not chosen to become a part of the American mediascape; they had just married the best pilots in the country. Their lives in Togetherville were stressful and their traumas were made public. Kappel tells their "unknown" stories, claiming that all previous reports, by focusing on the husbands' adventures, the technical details of the missions, or the political undertones of the space race, lacked the female angle. Writing about astrowives, she writes about friendship and American identity. Apparently, she set about to expose how these women were forced to look and talk the way the authorities wanted them to, and how the ideal mature American woman was produced according to a political agenda, but soon she fell in love with the stories she found. She describes the wives with a focus on style: Renee Carpenter was a platinum blond and JFK's favourite; Jane Conrad was tall and thin like a model; Pat White was petite and prettily delicate. Moving to Togetherville, the astrowives become stars: their elegantly made-up faces adorn the covers of *Life* magazine, Jackie Kennedy invites them to tea, and their dresses are tailored in the Doris Day style. They are coached on how to behave, what to wear for interviews and measures are taken to avoid scandal. They are supportive of one another, teaching each other how to maintain some privacy and deal with the constant surveillance of NASA staff. The women bake cupcakes decorated with small flags, cook meals and gather in the living rooms of the ones whose husbands are "up there" to help during the difficult time: one pours the coffee, another empties the always over-flowing ashtrays, yet another manages the media.

Nesbit, Kiernan and Koppel are interested in a behind-the-scenes view of the war, the arms race and the space race. All three authors adopt a female perspective to tell their readers about a little-known side of well-known histories. In this respect, their books are similar to many other late 20th-century books devoted to women who played an important role in the development of science but, allegedly because of their gender, were never recognised as ground-breaking physicists, mathematicians or engineers. It is the focus on wives who did not crave any special recognition that makes these three books so original. Yet the originality comes at the price of neglecting the few women who did make their names in physics. Judging from this handful of examples, contemporary popular culture does not know how to cope with non-standard cases of women and physicists of the past. Women who were clearly unjustly treated by the world of science are the subject of clichéd and often heavily ideological media narratives that conform to fit a feminist political agenda. Forgotten wives are brought into the spotlight in nostalgic media accounts

of different Togethervilles, in which the values that contemporary society misses, such as patriotism, female solidarity, family values and marital fidelity, flourish. But successful, pretty, female scientists, such as Joan Clarke or Leona Wood, are either deleted from this picture or have their stories standardised. They are strangers in Togetherville. To quote Baudrillard again: "the media carry meaning and countermeaning, they manipulate in all directions at once, nothing can control this process, they are the vehicle for the simulation internal to the system" (84).

Alternate biographies

Taking into consideration the female characters depicted in the books discussed above, it seems that popular culture is incapable of avoiding clichés when presenting scientifically talented women from the past. They are either taken advantage of by males, who steal their discoveries, or excluded from the communities of scientists' wives (who know their place and help their husbands). Yet one can find kinds of popular writing that focus on famous women in the past and give justice to both their talent and their complex and unique personalities. These women are feminine but not "explained away" by their femininity. Significantly, the texts in question are not realistic but speculative fiction which, to borrow Baudrillard's term, "simulates" history.

In his seminal *Simulacra and Simulation* Jean Baudrillard argues that late twentieth-century popular culture is obsessed with history, which it tries to simulate[6] in response to the prevailing feeling of the lack of historical continuity, and of any reliable historical narrative bonding us to the past and explaining our world as resulting from past events. Baudrillard calls history-inspired popular tales "the phantasms of past history" (Baudrillard 43–44) which, without attempting to be accurate, play with the notions of the past, reenacting events and situations we know from history books and turning them into fiction. Similarly, some speculative fiction writers simulate alternate history scenarios to present "alternate" biographies of real women scientists from the past. Rewriting their stories in altered circumstances, they show what could have happened if the world had allowed these women to have their way. A radical example of such an alternate "simulated" biography can be found in *The Difference Machine* by Bruce Sterling and William Gibson. In this famous steampunk novel, an alternate Victorian England is ruled by a progressive party headed by Lord Byron. Steam is used to power all sorts of

machines, proto-computers included. One of the most powerful people in the country is the prime minister's daughter, Ada Byron, a gifted mathematician and the first programmer.

The "real" Ada Lovelace lived in the first half of the 19th century and was the daughter of Byron, who left England when she was small and died soon after in Greece. In 1835, Ada married William King, who became the Earl of Lovelace three years later. She then took the title of Countess of Lovelace. Ada was a talented child with a gift for numbers and languages. Her tutors taught her mathematics and science. She received instruction from, among others, Mary Somerville, a Scottish astronomer and mathematician, and Charles Babbage, a mathematician and inventor:

> Known as the father of the computer, he [Charles Babbage] invented the difference engine, which was meant to perform mathematical calculations. Ada got a chance to look at the machine before it was finished, and was captivated by it. [...] In her later years, she tried to develop mathematical schemes for winning at gambling. Unfortunately, her schemes failed and put her in financial peril. (www.biography.com/people/ada-lovelace)

In Gibson and Sterling's novel, Ada Byron is the world famous "Queen of Machines" or "la Reine des Ordinateurs". She specialises in formal logic and tries to devise a universal programming system. One of the most powerful people in Europe, the fictitious Ada is a gambler and a drinker, yet her science and her intellect are outstanding. Her lectures in the novel foreshadow the dawn of IT and the philosophy of communication. This former student of Babbage, whose proto-computer was actually built in this alternate world, revolutionised western civilisation; having never married, her genius flourished. Against all odds, she developed the theories conceived by her mentor.

According to Gibson and Sterling, there was no place for Ada to live the life of a famous inventor and scientist in the real 19th century; she is but a case of "what might have been", a subject of speculation. Had it been possible to take her out of this context and place her in more suitable circumstances, perhaps she could have changed the direction of technological progress. Their assumption is based on the modern belief that genius is not gender-dependent, that some women were born with extraordinary capacities in all historical epochs, but not all had opportunities to develop them.

Alternate history, a subgenre of science fiction, makes it possible to present outstanding women of the past by re-shaping the historical epochs they lived

in, including social conditions, systems of values, and dominant ideologies. The second type of popular literature capable of dealing with female geniuses of the past that I found is speculative fiction focussed on science, morals and how scientific inventions influence our lives. In these texts, scientists of old are shown first and foremost as moral beings as opposed to gendered beings. In the fictive depiction of Marie Curie-Sklodowska, perhaps the greatest female scientist of the last century, one can find attempts to show her as a scientist with a conscience; gender does not determine her stance. Having observed the atrocities of World War I, Madame Curie might have been aware that her and her husband's science would be used in the future to make even more destructive weapons. *The Microverse*, a volume of popular science essays-cum-science fiction stories concerned with the newly discovered phenomena of the microworld is a dual book. The most "fantastic" recent discoveries (the genetic code, the molecular world, the nuclear world, the electron, particle physics, quarks, and others) are presented first from the perspective of a scientist and then from that of a fiction writer. In "The Nuclear World" section of this book, just after an essay discussing the history of the analysis of matter and speculations about its nature, we read the short story "Half-Life" by Paul Preuss. The story consists of Marie Curie-Sklodowska's inner monologue on her last day. Dying of leukaemia in a Swiss sanatorium in 1934, surrounded by her loving daughters and son-in-law, Madame Curie recalls the most vivid moments of her eventful life. Memories, dreams and delirious visions blur. She sees her and Pierre Curie's first makeshift laboratory, where they attempted to separate the salts of radium from tons of residue while nursing their baby daughters; she re-lives the trauma of her husband's tragic death; and she has a premonition of her daughter, Irene Joliot-Curie and her son-in-law, Frederic Joliot receiving the Nobel Prize they have long deserved. As her temperature drops and death approaches, Madame Curie's memories grow darker. She feels cold as she remembers World War I: the young men dying by the millions in the mud of Verdun and the Somme, the field hospitals, the bloodied surgeons cutting bodies to remove shell fragments, herself and eighteen- year-old Irene in the trenches in a radiological station they had organised with an X-ray source and some plates, and the radiological corps she had established. She hopes her science will save lives, help cure the atrocities of war.

> Yet Madame Curie's monologue ends with a strange premonition: the memories of Pierre's death are mingled with a vision of deaths to come: The slick wet pavement of the rue Dauphine which tilted from under Pierre's

> desperate feet has turned to a bubbling mass of asphalt. People are fleeing along the melting boulevards, toward the boiling river. I have been in this landscape before, this tumble of rubble lit by the candelabra of burning trees; I have looked out upon the no-mans-land of the western front. But this population – these outstretched arms, these uplifted faces – these people are Orientals. (Preuss 184)

The trauma experienced by the inhabitants of Hiroshima and Nagasaki results from the very same discovery of radioactive elements that marked her life's achievement. The dying scientist does not have a clue who these "Orientals" are; we readers do. This bleak vision is followed by one more atrocious image, but this time we cannot be sure what Curie sees: perhaps the Eniwetok and Semipalatinsk nuclear test sites, or, perhaps, a snapshot of World War III:

> Through the rolling clouds I hear the denaturated metallic voice again: Three. Two. One. [...]
> A horror of light bursting upward through layers of cloud, streaking outward along thin cloud layers, discolouring the surface of the ocean.
> Three. Two. One. [...]
> An ocean heaving itself toward heaven but failing to escape the earth, falling back in a million Niagaras upon the hole in itself that was a coral island.
> Tri. Dva. Adin. [...]
> A frozen steppe vaporizing in a concussion as of a ravening comet, falling upon the Earth. (185)

Preuss's story is short and does not attempt to present a detailed portrait of Madame Curie; nevertheless, he achieves something rare and unique: he shows her as a scientist and as a woman – a widow, a mother, a mother-in-law – a complete human being whose gender does not define her away. Preuss tries not to create fiction but, paradoxically, to simulate history.

Conclusion

At the beginning of this paper, I made the reservation that my research is limited to a contemporary Western popular culture that shares the same set of beliefs and values. In the ideological framework of a non-Western culture or culture from another time period, for example, Chinese culture, Japanese

culture, the culture of the Third Reich 1933–1945, or the Soviet culture of 1917–1989[7], the women-and-science motif might produce quite different stories. However, such a comparison goes far beyond the scope of this paper. In my attempt to find instances of the women-and-science motif in popular Anglophone books and films set in the past, I came across a number of stereotypes and only a few genuinely original depictions. These stereotypes – lonely forgotten geniuses, female worthies taken advantage of, ostracised women accused of not being feminine enough, and devoted wives who help their men and their countries in World Wars I and II or the Cold War – reflect ideologies that Western culture used to believe in. According to such beliefs, women are born to be male companions, women need male protection and women should help in patriotic endeavours in their own way.

Conversely, the two original presentations of past female scientists that I found both come from speculative fiction concerned with science and which are heavily influenced by the ideologies of science: science and pacifism, science and a sense of guilt, and science as a weapon in the quest for democracy and freedom. Gibson, Sterling and Preuss imagine the women in the past in a way we consider fair. They do not write about the past, they only simulate history alluding to the texts that readers are supposed to have read, thus closing us in a vicious circle of texts corresponding with one another, but never in fact touching the extra-textual world of past or present. Baudrillard argues, "[h]istory is a strong myth, perhaps ... the last great myth. It is a myth that at once subtended the possibility of an 'objective' enchainment of discourse" (47) – and speculative fiction writers seem to agree.

Notes

1. It is enough to compare Robby Keough, a scientist working for the Center for Disease Control in the 1995 drama, *Outbreak*, directed by Wolfgang Petersen, to Dr Erin Mears, a CDC epidemiologist in the 2011 Steven Soderbergh film, *Contagion*. Both women are outstanding professionals, who selflessly and devotedly fight a pandemic. Yet Robby is first and foremost the ex-wife of the even more talented Sam Daniels. She falls ill while conducting research, and he rescues her by finding the cure, which finally leads to the reunion of the couple and the happy ending the audience is hoping for. On the contrary, Dr Mears's private life is not shown on-screen, we just see her fighting the disease. When she falls ill, she dies helping others and is buried with the victims of the pandemic in a collective grave. Neither Keough nor Mears are trying to behave like men; they retain their femininity, and no one finds their professional expertise awkward.
2. Interestingly, in the film's prequel, *Prometheus*, which Scott produced in 2012, Ripley's role of a female survivor who understands alien life is given to a woman scientist,

Dr Elizabeth Shaw, played by Noomi Rapace. One may perhaps argue that by 2012 the human race has placed its hope for survival on its science more than its military strength.

3. Fossey, as played by Weaver, has become the paragon of the strong-willed but self-destructive female scientist. As far as popular science is concerned, a similar figure is Rosalind Franklin, the woman whose work was essential in the discovery of the structure of DNA. Franklin was not given the Nobel Prize that went to her male colleagues James Watson and Francis Crick. In the first edition of Watson's memoirs, *The Double Helix*, her portrayal is far from flattering. She is moody, unsocial, ugly and unfeminine. In the second edition, published during the period of the Women's Liberation Movement, Watson apologised for depicting Franklin in this way.
4. This does not seem to be accidental, especially since variations on the same scientist-mother (daughter) motif can be found in other science fiction films such as *Gravity* by Alfonso Cuarón and *Contact* by Robert Zemeckis. In each, the female scientists – an astrophysicist and a medical engineer – struggle with personal problems such as the loss of a loved one, loneliness and being lost in one's work, but their personal lives are only the backdrop against which the story of science is written.
5. The debate on Mileva Marić is not limited to journalism. In 1994, feminist sociologist Hilary Rose wrote in her book *Love, Power and Knowledge: Towards a Feminist Transformation of the Sciences* that Marić co-authored the ground-breaking papers published by Einstein in 1905 in the Leipzig journal *Annalen der Physics*. Rose claimed that "two of the originally submitted papers were signed also by Mileva but by the time of their publication, her name had been removed" (143). Allen Esterson, in his polemic "Maintaining Scholarly Standards in Feminist Literature. The Case of Mileva Marić, Einstein's First Wife", proves that Rose's source here is Desanka Trbuhović-Gjurić's biography of Marić written in Serbian and translated into German in 1983. Trbuhović-Gjurić writes from a very strong patriotic perspective, calling Marić "our great Serbian woman". Her research for the biography consisted of interviewing relatives, friends and acquaintances of Marić, which she did sixty years after the Einsteins' marriage had ended, and some of the records were second- or third-hand and thus hardly reliable. Trbuhović-Gjurić's theses were disproven by a number of researchers who read her in Serbian (Stachel 2005, Martinez 2005), yet passages of her book translated into English (often from German) keep re-emerging.
6. By "simulation" Baudrillard famously means: "the generation by models of a real without origin or reality: a hyperreal" (Baudrillard 1).
7. Discussing the period 1917–1989, one cannot talk about the emancipation of Soviet women – they had already been emancipated and – for ideological reasons – considered fit to work in mines and study at universities – the latter only if their family was of low-class origin. The daughters of the bourgeois families could not enter important positions in public life and neither could their brothers.

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