Ruminations:
The Andrean Journal of Literature

St. Andrew's College English Department Research Publication

ST. ANDREW'S COLLEGE OF ARTS, SCIENCE & COMMERCE
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Editorial

Climate change fiction, of cli-fi as it is more popularly known, is a relatively new genre, and hence research on cli-fi is also too recent to allow for the kind of deep and scholarly readings that characterize older and more established genres. The time was ripe to take a critical look at climate change fiction. Our annual departmental conference "The Possible and Impossible Worlds of Science Fiction" (11-12 September 2020) aimed at enabling an understanding of climate change fiction as dealing with more than just the cliched theme of global warming. The papers published in this volume explore various facets of climate change representation in both the verbal medium of literature and the visual medium of cinema. Taken together, they reveal how the environment intersects with culture, gender, science and politics, and thus highlights the inherently interdisciplinary basis of climate change fiction as it brings together the real and the imaginary across time and space.

Diya Rajput's paper "Degrees of Victimization by Climate Change in Literary Fiction: *Leila*" explores, the impact of climate change across three generations in Prayaag Akbar's dystopian novel *Leila*. Rajput argues that phenomena such as social inequality, acute water shortages, implementation of toxic (for the oppressed) technology to produce clean air for the privileged, Hindu extremism, attacks on feminine reproductive rights and segregated gated housing are not entirely futuristic projections since they are already imminent in contemporary India. For this reason, she claims that the differences between the victimization of the three generations in *Leila* lie more in the degree of victimization rather than in their essential nature. Finally, while she lauds Akbar's attempt to centralize the issue of climate

change, she also notes significant omissions in his futuristic representation of an India under the totalitarian regime of The Council.

"NOT COMICAL! How Comics and Graphic Novels can change Our Perception Towards Climate Change" by Ashmi Sheth examines the potential of genres such as comics and graphic novels to not only draw attention to the dangers of climate change but to also spur us to take the steps necessary to mitigate the environmental crisis. Sheth explores the effect of Philippe Squarzoni's path-breaking graphic novel *Climate Changed: A Personal Journey through Science* (originally published in French in 2012 and later in English in 2012). Written in the form of a memoir, Squarzoni traces in his award-winning book (it won the *l'AcademieFrancaise's 2012 Leon de Rosen* prize) his own journey into the intersection of climate science and politics. Sheth argues that the visual appeal of comics and graphic novels together with their ability to impact readers on both emotional and cognitive levels are responsible for their transformative potential*:* "Graphic narratives provide a uniquely effective representational medium for locating the contemporary environmental imagination and for illustrating the theoretical complexities of the real world."

The antihero of science fiction is the focal point of Ishika Saxena's paper "The Antihero in Science Fiction: A Close Reading of *Flowers for Algernon* and *Holy Fire.*" As she traces the narrative arc of the antihero in *Flowers for Algernon* and *Holy Fire* with a focus on the formal features that characterize the genre of science fiction, namely the *novum* and *cognitive estrangement*, she notes that both of these novels reveal how the antihero within science fiction violates the principles and internal logic of the established novum within their fictional worlds. Ms. Saxena's study of the delineation of the effects of a scientific experiment on the intelligence of its protagonist

Charlie in *Flowers for Algernon* and of an age-defying experiment on Mia, the protagonist of *Holy Fire* raises pertinent questions about the reasonability and purity of the science within the novums as it examines how cognitive estrangement is produced and to what ends it is deployed in both the futuristic dystopian novels.

"A Heavily Edited Timeline": Feminisms, Time Travel and Memory in Annalee Newitz'*The Future of Another Timeline* by Mavis Rodrigues examines Newitz's linking of the popular time travel trope in science fiction with memory and feminist concerns. As Newitz reimagines a feminist past, present, and future through time travel and memory, she also posits an alternative vision of history. Rodrigues notes how Newitz's destabilization of the temporal, historical and gendered aspects of human existence unfolds against the backdrop of the riot girl movement in the early 1990s, although as Rodrigues observes, Newitz's depiction differs in its representation of the riot girl movement as "diverse, representative and inclusive" and thus creates "an alternate history of a world that is similar and yet different from the one we occupy."

In "God as Machine: The Evolution of a Distinctive Indian Science Fiction Cinema," Vijayakumar analyzes the bricolage of narrative strategies and audio-visual assemblages deployed in Indian science fiction films with respect to the films *7aum Arivu* (2011) and *Baar Baar Dekho* (2016). The intersection of religious and mythological themes in Indian science fiction films such as in the two films under scrutiny, encoded in the respective film-makers' visual and aesthetic choices, give the Indian science fiction film a distinct identity, setting them apart from their Western counterparts despite the tendency of Indian science fiction film-makers to borrow elements of science fiction common in Hollywood science

fiction cinema. Vijayakumar examines how the desire to reach the Indian diaspora spread far and wide, or what Vijayakumar refers to as the "geopolitical ambitions of Indian science fiction cinema," ultimately leads to the advancement of a "transnational cosmopolitanism" in Indian science fiction films.

"The Structure of 'Scientifiction': Thought Experiments in SF by Indian Scientists"once gain turns its gaze onto Indian science fiction, with a specific focus on how Indian scientists have been producing SF in English. The author, Ankit Prasad, claims that such science fiction utilizes the short story format and has been shaped by the (stated) motivations of Gernsbackian 'scientifiction,' a combination that Prasad notes is in the nature of a literary-scientific 'thought experiment'. This study of two Indian SF short stories, namely "The Rare Idol of Ganesha" (2015) by astrophysicist Jayant Narlikar and "When the Tide Turns" (2006) by zoologist Sukanya Datta highlights the features characteristic of thought experiments in the two short stories selected for analysis whiles also observing how the authors of the two stories use fiction as a viable and appealing vehicle for bringing science closer to uninitiated readers, thus making SF by Indian scientists distinctive from SF by other Indian creative writers.

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AUTHORS' BIO-NOTES

Diya Rajput is a graduate from St. Andrew's College of Arts, Science and Commerce, Mumbai, with a B.A. in English Literature. She is currently pursuing her LL.B. from Jindal Global Law School, Sonipat. With a keen interest in Literary and Legal Theory, she strives to extend a multi-disciplinary approach to the study of Law and Literature alike.

Ashmi Sheth is an artist, author, and 3d Animator based in Mumbai. An alumna of St. Andrew's College of Arts, Science, and Commerce. Ms. Sheth is now pursuing a Master's Degree in Counseling and Art Therapy from Edinboro University, Pennsylvania, USA. Immensely passionate about the arts, Ashmi strongly believes in the therapeutic power of the arts to heal people and change lives. She self-published her poetry book, "silence echoed: poetries that heal" in 2019 and is currently a writer under the Arts and Culture vertical for The Womb - India's first e-newspaper for women. You can find her as @artist_ashmi_sheth on Instagram and as @Ashmi_Sheth on Twitter.

Ishika Saxena graduated with distinction from SOAS, University of London, being awarded the 'Special Language Scholarship', and a distinction for the dissertation titled "Marxism and postcolonialism: a Reparative Reading through Walter Benjamin's Historical Materialism" in MA Postcolonial Studies in 2021. Ishika's academic interests relate to political thought and theory, critical theory, literature and aesthetics, philosophy, and ethics. Ishika's noteworthy works include, "Ethical Decision Making: Problematizing the human and ethics, in the Context of Self-Driving Cars" (published in *Life Choices: Multidisciplinary Essays on Existentialism and Ethics*, 2020), "A Feminist Critique of Distributive Practices in India" (presented at the "International Gender Conference", 2020),

"Cognitive Psychology in the Context of Intersex and Trans Identities" (published in *Confluence: Journal of Interdisciplinary Studies*, 2019), and 'Search for Life'(published in The Indian Institute of Astrophysics newsletter, 2018) amongst others.

Mavis Rodrigues is currently working as an Assistant Professor of English at Government College of Arts, Science and Commerce, Khandola, Goa. Her research interests include genre fiction, contemporary poetry, and narratives in visual media.

.**Vishnu Vijayakumar** is a Research Scholar in the Department of Film Studies, at the English and Foreign Languages University, Hyderabad. He is currently working on his thesis that deals with the discourses of science and technology in Indian cinema. His other areas of interest are science fiction cinema, genre studies, discourse analysis, film theory, and national cinemas.

Ankit Prasad is a Junior Research Fellow (PhD), The English and Foreign Languages University, Hyderabad. His research interests include Science Fiction, Literature and Science, Myth Studies, and Philosophy of Science.

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Degrees of Victimization by Climate Change in Literary Fiction: *Leila*

Diya Rajput

Abstract

If the urgency of a subject were indeed a criterion of its seriousness, then, considering what climate change actually portends for the future of the earth, it should surely follow that this would be the principal preoccupation of writers the world over- and this is very far from being the case, says Amitav Ghosh in his lecture presented at the University of Chicago in the fall of 2015 (10). On the other hand, climate change here is not a danger in itself, but rather a "threat multiplier" that deepens already existing divisions and leads to intensification of a range of conflicts. The unavoidable consequences of any phenomenon, especially those which are as big in magnitude as climate change is, affect every citizen in a nation state, but not equally. For some, one of the reasons to worry might be a domestic worker touching their child without having a bath, whereas others might be struggling to get a bucket of water for months.

The purpose of this study is to highlight how the magnitude of climate change affects various sections, and explores the intersections within the dystopian society of Prayaag Akbar's *Leila*. Leila's identifiers of the future—social inequality, acute water shortages, implementation of toxic (for the oppressed) technology to produce clean air for the privileged, Hindu extremism, an attack on feminine reproductive rights and segregated gated housing—are not as shocking, for these are the troubles that play out in present day India with alarming regularity. The difference between the victimization of the three generations in *Leila* lies not in the nature of such victimization but in its degree.

Keywords: Climate Change, Climate Fiction, Systematic Structural Injustice, Generations

Introduction

There was never a time, of course, when forces of weather and geology did not have a bearing on our lives—but neither has there ever been a time when they have pressed themselves on us with such direct relentlessness as in *Leila*. This paper examines the dynamics of a world infected by climate change in Prayaag Akbar's novel *Leila* (2017). Recognition, as Amitav Ghosh writes in *The Great Derangement*, is famously a passage from ignorance to knowledge (3). To recognize, then, is not the same as an initial introduction. The dystopian world of *Leila*, despite being fictional, is completely recognizable. Climate change here is not a danger in itself, but rather is a 'threat multiplier' that deepens already existing divisions and amplifies the intensification of a range of conflicts.

Although nowhere does Akbar talk about the novel being set in India, the setting of the novel is very specific. The mis/management of this nation aims to bring peace by segregation. Therefore, a city is divided into "sectors" with sky-high "walls" connected by "sky roads" and within each sector, citizens are free to practice their beliefs under a totalitarian regime that abducts and brainwashes at will. This leads to a practice of systematic structural injustice. Akbar provides flashbacks and a gradualist view to the building of this nation, prioritizing the transformation of its physical world as the setting but it does not tell us how a semi-functional democracy careens into totalitarianism with such astounding rapidity, as pointed out by Gautam Bhatia in his review of the novel for *Strange Horizons* (n.p.).

This paper studies the degrees of victimization by climate change in *Leila* across the lives of three generations that can be spotted in the novel- the generation of Shalini's parents, Shalini's generation and the generation of Shalini's daughter, Leila. From an

ethical perspective, some of the most pressing questions concerning the balance of mitigation versus adaptation can be traced in the context of *Leila* through the lived reality of these three generations victimized by climate change. The novel reveals value, behavior and identity-based tensions arising among generations. Given the complexity of the dynamics of victimization at the intersection of climate change and social injustice, even the realities of the three generations spanning in the novel are different. The following paper is thus divided into three sections, each dedicated to one generation and is followed by a conclusion.

First Generation

Most of the knowledge that is provided to a reader about the first generation, the generation of Shalini's parents, is mediated through the memory of the narrator. Shalini's flashbacks and nostalgia thus structure the novel. This is the generation that has grown up in another world with another reality where everything was perhaps greener. In the later years of their lives, climate change and the council changed that conventional reality of their lives and thereafter, the rest of their lives merely become a struggle between mitigation and adaptation. This struggle is clearly visible in the fact that Shalini's parents had changed multiple houses after the city had started with its dystopian transformation. Shalini also narrates an incident where her parents spoke about a woman going through their trash can to check for leftover animal bones every day. Naturally, this activity troubles Shalini's family in the Gupta sector. What one puts into one's body is not only personal, but is also intrinsic to family and belief. In the contemporary context of India, this can be equated with the extremity of the beef ban in many societies. It is ironic that this particular restriction on certain foods when climate change is at its peak has nothing to do with climate change in the novel. The authorities (the council) do not bother to cover the communal and

religious reasons behind the ban even in the name of the apparent climate change in the novel. The psychological trauma of Shalini's father while adapting to this cruel reality is especially disturbing. However, since this generation has known a better world, they sympathize with victims of climate change the most.

Third Generation

The third generation of Shalini's daughter, Leila, is born into a seemingly opposite reality. It is difficult to understand how this generation perceives a world not infected so much by climate change, given that they are born into it. Shalini provides an insight into this when she talks about Leila's illness:

Every year the temperatures rose and the water problem worsened. Our fifth summer in the East End—Leila closing on three—the air was so dry you could hardly sweat. The newspapers led with panicked articles about the record-breaking heatwave. Snot clung to the wings of your nose and was painful to pinch out, breaking free in lumps like little stones. Leila began to get dizzy spells. She seemed tired all the time, pale. Her doctor said it was sun exhaustion. We had to be careful, make sure she got lots of water. (Akbar 86)

Naturally, the kids born inside the sectors would know of clean air and water as artificial provisions by the ruling government body. On the other hand, the kids born outside the sectors would know of clean air and water as an expensive luxury and live a life characterized by survival only. This directly alters their perception of what is 'natural'.

Second Generation

The issue of morally permissible risk imposition is a particularly complex problem about climate ethics in the world of *Leila*. The governing body, the Council, is blamed by

the narrator throughout the course of the novel for exploiting the population mercilessly. The headquarters of 'The Council' are in the political sector of purity one. Gautam Bhatia in his review for the novel writes that for a city to establish its ruling council it would firstly have to destroy or dissolve every other functioning institution that structures Indian life today (n.p.). Akbar gives no insight into how that might have happened. It could be a deliberate authorial choice in which the author expects the reader to fill the gap but it is a gap too large for the reader to fill.

The political rally outside east end about the misuse of water in that sector is the only incident that indirectly provides a hint about how Council must have come to power. It mentions that the Council is no different from the previous government in using the same underprivileged population and climate crisis for political purposes. It can also be noted that Mr. Joshi, the head of the Council does not bother to give false promises at the mob gathering to protest about water wastage. It proves that he is incapable of talking about anything not related to his government's political agenda. Nevertheless, the crowd from the slums still answers his call for a protest as a result of being blindly hopeful. Political motives which should not even be in the picture at such a time of urgency are deliberately pressed despite being morally impermissible. Akbar elaborately writes about this water shortage issue. The present day parallel of this is seen in the government of India's new body called 'Jalshakti', which includes the Ministry of Water Resources, River Development and Ganga Rejuvenation, and the former Ministry for Drinking Water and Sanitation. Checking river Ganga's water quality in 2018, it was discovered that out of 70 monitoring stations, only seven had water fit for drinking after disinfection and only about 10 for bathing (PTI n.p.). The water shortage issue thus presses directly and relentlessly in the novel.

Another significant event orchestrated by the Council is named 'skydome' by the author. Unlike the dome in the popular American TV series 'Under the Dome,' where the government tries to break the dome and rescue the citizens inside, the dome in *Leila* is government instituted, and citizens are intentionally cut off from the rest of the world. It is the author's techno utopian device of choice, an air conditioner that privatizes air and can even change seasons. This also raises the question of morally permissible strategies used by the ruling bodies. The Council's need to dominate outweighs its duty to take the steps necessary to fight climate change. This makes everyone not in the vicinity of the skydome system a 'victim,' as if climate change alone was not enough of a victimizer. This prioritization and hierarchy of the provisions to citizens in the name of purity is a political agenda. A world where air and water are proposed as luxuries is absurd. As Timothy Mitchell notes in *Carbon Democracy*, existing forms of democratic government appear incapable of adopting measures to protect the long-term future of the planet, and even after doing so, it makes us wonder whose lifestyles they are willing to sacrifice in the process (n.p.).

If analyzed ethically, even the narrator Shalini, the flag bearer of the second generation in the novel, is no different than the Council. If the Council installs air conditioners for an entire sector knowing the risk of the slums catching fire, Shalini also decides to celebrate Leila's birthday around an artificial swimming pool when more than half the population is undergoing serious water shortage. It is important to note that the only difference here is of scale and magnitude of the action, and not the nature of these actions. Her language while she reflects on her old days is still insensitive and self-centered instead of being apologetic. Even after being victimized by climate change in later years, Shalini is not regretful of her former insensitivity. However, Shalini's insensitivity does not arise out of

ignorance. She is totally aware of what climate change and climate politics does to humanity, as is evident in her description of the skyroads:

Smells so thick you can taste them. When your children fire bottle rockets over the walls of their sector, trying to hit the Slum roofs, smouldering dregs of fireworks come floating down on me as I'm walking. When a load dumped from a trashtower comes gush-tumble-bouncing down a sector wall, the warm, gritty splash carries to the other side of even the widest road, leaving a rain of brown drops on my shoulders, my hair. Papa was right. These walls diminish us. Make us something less than human. (Akbar 38)

The hypocrisy of her generation is represented accurately by Shalini. Even in the last chapter of the book, the language of her confession to Sapna sounds more rehearsed than genuine. Perhaps the walls did make all of these characters something less than human after all.

The character of Sapna, initially Shalini's maid and later the wife of a newly established politician is characterized in many ways similar to Shalini, except for their movement on the scale of social mobility. She is not a part of what her own people are fighting for. She visits the site of protest to merely see her boyfriend. It is also through her encounters with Shalini that the message of water being a symbol of luxury in the novel is expressed. When Sapna steals water from Shalini and when she later serves water to her in a plastic glass are two such instances. Clearly, Sapna has never been a sympathizer and her characterization is important to note while talking about this second generation.

The above three generations were the residents of the city presented by Akbar, but his secondary plot surrounds the life outside this city, the life of the slums. This sub-plot is

used as an additional setting by the author to create contrasts. The slums are situated next to the landfills where garbage is dumped outside the sectors. The author does not address why these people are not a part of the sectors. Is it because of population explosion? Is it because of where they lived when the transition happened? Such assumptions might not be true if the city is planned. This implies that the place must have been allotted to them by the Council. These people are not allowed in the sectors and have no jobs. Garbage is dumped directly in their settlements, the impure air from the sky dome is released directly in their settlements and ironically, they are also beaten up for the land fires caused by the combined effects of these. In the earlier years of the Council, it pretended to sympathize with this population but later on, discards them like outcasts. One might wonder about the purpose of their existence except for being the direct 'victims'. In an interview, Akbar states: "There is some great anthropology that examines how all of us in India view public and private space- why we are so obsessed with keeping our own homes pristine while the garbage and filth gathers just outside the walls of our homes." (Kappaln.p.)

In her conversation with the residents with Shalini, it is clear that there is a sense of anguish. However, why do they not rebel is a question that is left unanswered. The following description by Shalini provides a picture into the lives of these slum residents spanning across their three generations:

It was hotter that summer than it'd been for a hundred years. Why do they tell us things like this? Trees sagged like broken men. Still no one followed the rules: the construction boom and the factories took the groundwater almost to zero. On TV they'd show clips of wailing Slum women, banging brass pots, dragging reporters by the wrist to the insides of dark huts. Children leaned dazed against the walls, their lips near transparent in the glare of the camera LED. They breathed in jerky, rapid gulps and cried without tears. A thin,

dry smack after every word they could push out. The old folk looked even stranger, so pale they were tinged blue. The young men interviewed didn't talk to the reporter. Instead they shouted directly at the camera. Eyes flashing, cracked lips, chests out, they stared through the screen right at you and spat their words with choked anger, asking why their families had been ignored so long. (Akbar 88)

In the political rally outside East Slum, Shalini mentions that there were about 3000 of them around her. These were the residents of only one slum. When the author claims that there are so many other slums, it implies that there are many more of such victims. Yet there is absolutely no resistance to such climate politics. The slum dwellers might be threatened and terrified by the Council but that is only a more pressing reason for them to rebel. However, if that were the case, it implies that even to speak of the weather, the safest of all subjects, meant risking a quarrel with a denialist neighborhood, such as the one in the novel.

Conclusion

It is important to understand the unaddressed dynamics of the world that Akbar has tried to project. The author covers the issues of victimization by climate change of the majority population but does not mention anywhere about ability, homophobia, transphobia and/or about the intersection of various other issues in present day India, and the variation in the effects of climate change on different sections of minorities. It is never mentioned in the novel that the population now worships climate or ecology or any nature related factor, but neither does it talk about god or other supernatural power or belief system that the population holds on to. It talks about reflecting on old rituals and customs but does not mention any institution of faith. One might wonder how a country like India functions without faith, especially in times of adversity. No character in the novel talks or wonders about the future generations or about creating a sustainable space for their own children

despite motherhood being one of the principal themes of the novel. The kind of imagery that the author projects about the future makes it sound like the struggle for action will be difficult and hard-fought, and no matter what it achieves, it is already too late to avoid some serious disruptions of the global climate. But just like Ghosh in *The Great Derangement*, I would also like to believe that out of this struggle will be born a generation that will be able to look upon the world with clearer eyes than those that preceded it; that they will be able to transcend the isolation in which humanity was entrapped in the time of its derangement; that they will rediscover their kinship with other beings, and that this vision, at once new and ancient, will find expression in a transformed and renewed art and literature.

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AL! How Comics and Graphic Novels can change Our Perception Towards Climate Change

Ashmi Sheth

This paper studies the effect of comics and graphic novels on how we perceive issues like climate change and concern for the environment. There is limited research on how creative mediums of storytelling, like graphic novels and comics, can be effectively used to create awareness regarding complex issues related to the environment among people of all ages. This paper attempts to analyze existing research on how comics and graphic novels have been able to sensitize people towards alarming issues of climate change through its blend of graphics and text, and encourages people to take a call for action. The paper also studies the effect of the ground breaking graphic novel, *Climate Changed: A Personal Journey through Science,* along with a few other works, in raising issues related to climate change. Through these studies, this paper attempts to illustrate how graphic novels and comics can be an interesting and helpful tool for communicating issues such as climate change and encourage people to take action for the betterment of the environment.

Introduction: Earth cannot cry! It's already short of water!

Earth's climate is now changing faster than at any point in the history of modern civilization, primarily as a result of human activities. (U.S. Global Change Research Program). Thousands of studies conducted by researchers around the world have documented increases in temperature at Earth's surface, as well as in the atmosphere and oceans. The Intergovernmental Panel on Climate Change (IPCC), which includes more than 1,300 scientists from the United States and other countries, forecasts a temperature rise of 2.5 to 10 degrees Fahrenheit over the next century. However, research on people's perceptions and understandings about climate change do not reflect equivalent seriousness. A worldwide study by Lee et al. (2015) states that "more than a third of the world's adults have never heard of climate change." For example, 65% of the respondents were 'unaware' of climate change in India. Additionally, in a study by Bostrom et al. (1994) with staff and students at the Carnegie Melon University, on "Understanding people's mental models of climate change," it was found that lay individuals and even highly educated individuals hold misconceptions about climate change. It found that there were misperceptions about the relative importance of various causes of global warming. The flawed mental models, in turn, restricted respondents' ability to distinguish between effective and ineffective response strategies. In a study by Leiserowitz (2006), people were asked to provide the first thought or image that came to their minds when they heard the words 'global warming,' which was subsequently rated on a scale ranging from "5 (very negative) to +5 (very positive)". This study, conducted to measure people's emotional reactions to the risk of climate change, revealed that the images people associated with 'global warming' had only moderately negative connotations for almost all respondents. In another study by Leiserowitz (2005), a few Americans reported that they do not see climate change as an

immediate risk and that they tend to rank it as less important than other social issues like the economy and terrorism.

Understanding Climate Change

Climate change, as a slow and gradual modification of average climate conditions, is a difficult phenomenon to detect and track accurately based on personal experience. Insufficient concern and lack of trust also complicate the transfer of scientific descriptions of climate change from scientists to the public, politicians, and policy makers, which is not a simple transmission of facts. (Weber, 2010)

James Holland Jones, Professor of Earth System Science says that "Making science more widely accessible – and giving people an understanding for the ways that scientists actually work is key to humanizing them." He further explains how storytelling can be a powerful way of communicating complex environmental and climate issues and how the emerging genre of cli-fi may help motivate behavior change.

Why Comics? It's for children!

Although it is extremely difficult to define "comics," McCloud (1993), after much refining, defines comics as, "juxtaposed pictorial and other images in deliberate sequence." Many science communicators suggest that the key to effectively translating climate change research is to keep the message concise, accurate and interesting, all in one tight package. Perhaps, a comic strip would be the best platform to convey such scientific issues, in

which the cartoonist has just a few panels to neatly and accurately convey the findings, the alternative viewpoint and the gravity of the issue at hand.

A representative of The Helmholtz Association admitted that comics are an innovative way of communicating information and that it is a "way of opening the scientific community for the general public." Science communication through comics presents information differently from that of research papers or science magazines, thus attracting a wider audience. Even those who are not interested in science have an opportunity to learn about the life of scientists and their activities (Sarayeva, 2017).

Weber (2010), in his research article "What Shapes Perceptions of Climate Change," observes that both learning from personal experience and vicarious learning from statistical description contribute to people's perceptions of climate change (Weber, 2010).

According to Berninger et.al. (2010), comics have been marginalized or even ignored by critics and academia. This is perhaps because of the stereotype that comics are often not capable of communicating 'serious' matters, like human rights, or sensitive issues such as gender equality. Also, the public regards comics as a medium that is meant primarily for children (Versaci, 2007).

In the context of this study, the primary significant effects of comics are:

i) *Trigger emotions and feelings.* Images in entertainment comics can convey a certain amount of emotion and depth. Comics and graphic novels, being a site where "words and images" intersect, engage and immerse the reader into its

environment, and trigger greater emotional response. When a story engages a reader, she empathizes with the characters and the situation. Thus, stories are the key to getting people living in denial of the realities of climate change to change their minds. According to Weber (2010), behavioral research over the past 30 years strongly suggests that attention-catching and emotionally engaging informational interventions may be required to stimulate the public concern necessary for individual or collective action in response to climate change. The "immersive nature of comics" as Douglas Wolk points out, is a key factor in the pleasure offered by this medium.

ii) *Understand science better.* Many fiction comics communicate serious matters and contain, for instance, references to accurate scientific ideas and facts (Tatalovic, 2009). Instruction comics utilize images to attract readers "to convey relevance and set up visual analogies and recognizable situations." (Eisner, 1993). Illustrative drawings catch the eye of a broader audience and popularize the science subject. Science-themed comics, as Tatolovic (2009) states, may help to promote and explain science not only to students but also to the general public. The fictional elements and gripping narrative in graphic novels help explain real-life scientific phenomena in a "light" and casual manner, often incorporating entertainment and humor. These fiction elements enhance the enjoyment of reading and more effectively deliver scientific content.

iii) *Motivate to take action and change.* Comics, have been increasingly proving their mettle in encouraging people reflect on their habits or views on certain issues, and to consider change. As noted by Sarayeva (2017), comics or animations about Sustainable Development Goals (SDGs), diseases (IOM, 2017), community

integration (OSF, 2013), early marriage (UNDP, 2016), gender-based violence (Care International UK, 2017), or weapon contamination (ICRC, 2016) have been designed and utilized by national and international organizations.

The United Nations (UN) (2017) has its own website 'Comics Uniting Nations' that affirms the "transformative power of comics to educate people in every corner of the globe about the SDGs and empower them to create positive and lasting change in their own communities and worldwide." Graphic novels and comics about climate change create a platform for discussion around SDG #13 'Climate Action', which addresses climate change and its impact.

Understanding Comics

Throughout history, comics have harnessed the power of cartoons to command viewer involvement and identification, and Realism to capture the beauty and complexity of the visible world. Also, McCloud asserts that as a format or medium, the graphic novel has a lot of potential for transformative storytelling. Words and pictures *together* are considered, at best, a diversion for the masses (McCloud, 1993).

Any person, young or old, responds more to cartoons in comics as compared to realistic images, as in films, because when we abstract an image through a cartoon and "simplify" it, we focus on the specific details and eliminate what is unnecessary.

A central aspect of the comic form is what Scott McCloud calls "an artist's map of time itself" (McCloud, 2000). Other critics likewise agree that "to read comics is always

to see past, present, and future in a glance. We actually see past, present, and future laid out before us in space-time with every page" (Gardner, 2016).

Tim Morton (2010), talking about environmental aesthetics, says

> I believe that graphic narratives are an ideal art form for showing and telling us something more about our perceptions of our environments, our engagement with them and the extent of our impact on them—more, perhaps, than we consciously intuit from our actual day-to-day experiences.

Marion D. Perret (2001) identifies as "graphic liveliness" that compelling urgency that flows out of graphic images set in motion by "the dialectic between word and image" when an artist "draws for the mind as well as the eye." Graphic novels provide their readers an experience that allows for a repositioning that "radically destabilizes assumptions, re-presents a virtual present, and gestures towards an alternative future."

Sarayeva (2017), in her extensive research study, combines two methods: in-depth interviews with comics' authors and focus groups discussions with students about comics, in order to extend our understanding of what effect comics about natural hazards and climate change have. In a study conducted by Sarayeva (2017), some respondents admitted that science and art go well together and that this combination can help readers visualize consequences of climate change or natural disasters. Information about climate change or a disaster in comics was perceived as an instruction or a manual for action. Comics that focused on climate change led participants to reflect upon the author's intention to make readers think about global warming, change their behavior and adopt actions that mitigate climate change.

She also states that the samples of comics prompted discussions on various topics such as risk awareness, politics, corruption, leadership, ownership, disaster response, reasons for the problems and solutions to overcome them, among others. However, she observes that there are differences in people's perception and interpretations about climate change or disasters in response to the same comic strips.

Climate Changed: A Personal Journey through the Science

Originally published in French in 2012 and later in English in 2012, Philippe Squarzoni's graphic novel, *Climate Changed: A Personal Journey through the Science*, winner of *l'AcademieFrancaise's 2012 Leon de Rosen* prize, an environmental award given to a book or essay, is a sort of a memoir. The book traces Squarzoni's own journey as he learns about climate science and politics. Throughout the book, Squarzoni uses a variety of visual metaphors, sometimes dramatically, often quite subtly. A key recurring motif includes entrances, thresholds, and the important decisions that must be made by societies and individuals in response to climate change: "There's a doorway we need to pass through." In an interview with the author (Bernard, 2014), Squarzoni said that he tried to emphasize that "the problem with global warming is that you simply can't be afraid all your life." With the help of sharing his personal moments with his life partner, his dog, his travels, and his favorite movies, he explains and depicts "everything from atmospheric science to the Intergovernmental Panel on Climate Change, from climate disasters to renewable energies, adding in his own reflections and ruminations about it" (Bernard, 2014).

However, the book also claims that it is possible to reduce our energy consumption and minimize the effects of global warming. The ending of the graphic novel presents this

DURING THE LAST MILLION YEARS, THE CYCLICAL VARIATIONS OF THREE ASTRONOMICAL PARAMETERS HAVE ALSO INFLUENCED THE AMOUNT OF ENERGY THAT OUR PLANET HAS GOTTEN FROM THE SUN, DETERMINING EARTH'S CLIMATE . . .
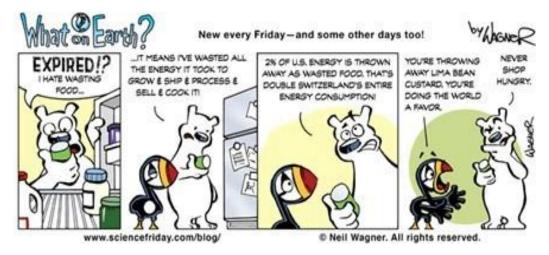
immediacy of action on our part and concludes with Squarzoni's honest feelings about the future with a message of hope. The original French title translates as *Brown Season,* and refers to that lifeless, muddy interval between winter and spring. As Squarzoni said in an interview, "I feel like humankind is in a similar state of transition."

"What On Earth?"

Neil Wagner, illustrator and writer of the blog and comic strip "What on Earth?" on National Public Radio's *Science Friday* website, uses humor to tackle the issue of global climate change and other environmental challenges. Wagner uses two characters in his comic strips to include both sides of the issue. Bebbo, the polar bear, discusses the latest research on environmental issues while Kito, the puffin, remains skeptical of these issues. Thus, an argument is more complete when the opposing side of the issue is addressed alongside the main point (Kline, 2010).

"The Rime of the Modern Mariner" by **Nick Hayes**

"Is it possible to update a masterpiece? Only, perhaps, with a brand-new masterpiece."

Drawn in 2010*, The Rime of the Modern Mariner* is a graphic novel by Nick Hayes based on Coleridge's original eco-fable "The Rime of the Ancient Mariner" written in 1797. Nick Hayes is a political cartoonist for The Guardian and was a founding editor of Meat Magazine, which showcased new writing, comics, and illustrations. He has won two Guardian media awards. Nick Hayes transforms the entire poem so the reader experiences an eco-fable set in our current period. The fable is now set in the "cesspool" of the North Atlantic Garbage Patch—thus adding a timely and resonant message about the destruction of our seas. This graphic novel is a response to the destructive nature of artificial waste in a natural environment, transforming a sailor on a doomed ship into a "modern mariner" stranded on a junk island in the Pacific. This fable places the modern mariner on a park bench, talking to an office worker about his adventures in a sea of plastic. In this version of the poem, the natural disasters take

form in giant piles of garbage in the water, and other problems suggestive of the habit of throwing away waste into the sea.

Hayes says that, "writing his own version of "The Rime of the Ancient Mariner" was 'a knee-jerk reaction'" (Ferguson, 2014). However, the original poem's enduring themes persist: compassion for nature, a sense of connection among all living things, and rightful outrage at man's thoughtless destruction of the environment. "The journey from Coleridge's to Hayes's pen is a natural – practically evolutionary – growth that reflects the circumstances in which the narrative was written."

Winding it up!

It can be concluded, as is evident from the findings of a few studies, that comics can have a certain effect on the perception of 'serious' issues. Comics as a genre of literature and form of art affect the reader on both—emotional and cognitive levels. An in-depth analysis of existing research reveals that comics do have significant effects on the perceptions of climate change and natural disasters, as well as of the consequences of the victims on the readers. Worldwide, educational attainment is the single strongest predictor of climate change awareness. Several graphic novels,

e.g.*Nimona* and *Climate Changed* have now been included in school curriculum for teenagers.

The graphic novel allows the readers to enter a new time, geography and perspective. It makes visualizing the future possible, eliminating the redundant and distracting by emphasizing on the specific details. Graphic narratives provide a uniquely effective representational medium for locating the contemporary environmental imagination and for illustrating the theoretical complexities of the real world. As Duncan (2012) noted, each individual perceives information communicated through words and images through their own perceptual filter that consists of beliefs, attitudes and knowledge. Thus, conveying information through the graphic medium can not only be challenging but also calls for further research on how serious issues in comics or graphic novels are perceived and understood. Despite the challenge, comics and graphic novels can prove to be an interesting and engaging medium for making people aware about scientific issues such as climate change, and may also help to stimulate action on the part of their readers.

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The Antihero in Science Fiction: A Close Reading of *Flowers for Algernon* and *Holy Fire*

Ishika Saxena

Abstract

The paper aims to study the narrative arc of the antihero within science fiction through a close assessment of the formal aspects of the genre. The two books studied are *Flowers for Algernon* and *Holy Fire*. The paper first introduces science fiction by looking at two formal aspects that are central to science fiction and which distinguish it from fantasy, that is, the *novum* and *cognitive estrangement*. The next section looks at the narrative structure of the two novels, through a specific assessment of the protagonist as the antihero and the journey of the hero. The paper finally argues that both of these novels indicate that the antihero within science fiction is a character that violates the principles and internal logic of the established novum within the novel. The antihero protagonist questions the strict adherence to science within both of these works, raising questions about the reasonability and purity of the science within the novums.

Keywords: novum, cognitive estrangement, narrative structure, antihero, journey of the hero

Introduction

Science fiction has distinct characteristics that help define it as a genre with specific modalities. Two such characteristics are the creation of secondary world (*novum*) and the production of a critical distance from the text in the form of cognitive estrangement. The secondary world exists within fantasy literature as well; however, certain features of this created world make a *novum* different from a fantasy literature creation. The two novels selected create fantasy worlds based on scientific principles extractable from contemporary science (both as a method and in the facts espoused by it). *Flowers for Algernon* centers its novum around intelligence as being desirable while *Holy Fire* employs the idea of an elongated life as the reward for living a moral life. The second aspect of science fiction, known as cognitive estrangement, is a relation to the text produced by the novum. The novum allows something unfamiliar to be introduced into an established understanding of science and the world. The familiar and unfamiliar work together to produce a certain distance from the text. Cognitive estrangement in both novels is produced through centering the protagonists who do not adhere to the central principles of the novum.

Therefore, exploring the narrative structure of both of these books (specifically examining the figure of the antihero and the journey of the hero) allows us to understand how cognitive estrangement works in these novels. The antihero in modernist and postmodernist fiction questions the established morality / principles around which the fictional world is ordered. Having antihero protagonists within a novum allows the central principles of the novum (which are an extension of known science, as described by Heinlein), to be questioned. These antiheroes follow the narrative structure of John W. Campbell's Hero's Journey which reveals how the structure of the narrative informs the antihero's disbelief in the principle of the novum.

There are several narrative similarities in the two books and they produce a similar cognitive estrangement through the decentering of stable meaning held at the center of the novum, through the figure of the antihero protagonist who follows the hero's journey.

Formal Aspects of SF

This paper seeks to look at the narrative arc of the anti-hero in science fiction literature through two books *Flowers for Algernon* and *Holy Fire.* Both texts have been selected for the subversive arc that the protagonists in these narratives follow. These novels, similar to most science fiction writing, focus on a singular protagonist which allows the tracing of the arc of the hero/anti-hero figure in this analysis. The aforementioned subversion is proposed to be located at the break from the norms of the novum that is created. The peculiarity of this, within a science fiction novel, is similar to what occurs within a fantasy novel. A secondary world in fantasy novels and a novum in science fiction literature are premised differently. The former is the new ordered universe that is created and operates with its own rules, as described by Ursula LeGuin. Science fiction, on the other hand, must adhere to the methodology and facts of science. Campbell states that "to be science fiction, not fantasy, an honest effort at prophetic extrapolation from the known must be made" (Eshbach 91). Therefore, while a secondary world and novum both create their own rules, the premise of novum as stated by Robert A. Heinlein must not violate any established fact of science (Eshbach 17). A further distinction is made in the methodology by which the internal logic or rules of the created world is defined. Heinlein defines science fiction as realistic speculation about possible future events, based solidly on adequate knowledge of the real world, past and present, and on a thorough understanding of the nature and significance of the scientific method. To make this definition

cover all science fiction (instead of 'almost all') it is necessary only to strike out the word 'future'. (22)

The books selected follow both facts and methods as established by science[1] and have been selected in accordance with the definition of SF as proposed by Heinlein. This offers a more focused scope for analysis than works of fantasy, which is necessary given the debates around the definitions of both fantasy and science fiction as categories.

The first text, *Flowers for Algernon* focuses on the idea of intelligence and a world based on such intelligence. The element of science is restricted to a top-secret government experiment which makes an intrusion into the life of the protagonist. There is a science experiment being conducted on a mouse called Algernon with the intention of increasing the brain capacity of the subject. This is later replicated on Charlie, the protagonist. However, Charlie is unaware of the fact that his brain capacity will quickly deteriorate after reaching its peak and that the lifespan of the subject is drastically reduced in the process. After his intelligence increases, Charlie reasons out the reduction in lifespan—something unknown to all until that point. The element of science is much more restricted here than in the other text being assessed. The book is written in an epistolary fashion, specifically as first-person diary entries by Charlie. The change in spelling and use of language indicates the rise and fall of intellect in the protagonist-narrator. There is a significant event during which Charlie wants to run away from the experiment taking Algernon with him. Intelligence is established as the desired trait given that the experiment

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1 Science, in this framework refers to both the facts established by scientific inquiry and the methodology of science (dominated by empiricism at the time).

and advancement of science places emphasis on increasing intelligence. Upon reaching this peak, Charlie begins to desire freedom. Charlie's initial understanding of the experiment is premised on the fact that being more intelligent would allow him to be more socially accepted, but after reaching the peak of his intelligence, he is isolated again. The desirable trait of the system falls short in delivering what was expected by Charlie.

The second novel, *Holy Fire* creates a novum that is premised on a futuristic society and ordered morality. Scientific advancement leads to the possibility of an indefinite extension and regeneration of life. This futuristic society (novum) is ordered around extremely stringent public morality. Citizens who adhere to the state's rules on morality in their personal lives are rewarded with life extensions. The indefinite extension of one's life is a reward and is therefore posited as the essence of the human. If they choose not to follow this order, they are left to die naturally. The protagonist of the book is Mia. At the beginning of the plot, she is rewarded with life extension and regenerative surgery. However, once she has the body of a 19-year-old, she travels to Europe and begins to encounter societies of subversives, artists and free thinkers and she no longer wishes to be a medically well-behaved subject. Despite having seen the benefits of the established order of the novum which is possible due to scientific advancement, Mia rejects this established order. The shift in Mia's behavior is made possible because once she becomes a 19-year-old, despite the wisdom of a 90-year old, Mia is essentially restarting her life. In Mia's reasoning behind taking this decision, she emphasizes the recklessness she can now afford, given that she is 19 again. Further, she discusses how not being reckless and adhering to the moral paradigm had made her lose the experience of youth; of holy fire. The

human's essence can therefore, not lie in the indefinite extension of their life as postulated by the centering of this as reward for good behavior within the logic of the novum.

Cognitive estrangement is a feature of science fiction that refers to a distance produced between the reader and the text through the creation of the novum. Both of these texts employ principles we understand as familiar (intelligence as desirable and rejuvenation of life as a reward) in a world that is familiar, yet through making these principles exist the reader is placed at a distance from the text. The biggest challenge to the principles comes through the role of the protagonists in both novels.

Cognitive estrangement is a unique adaptation of the concept of the uncanny as proposed by Sigmund Freud. Broadly, these concepts of formal logic can be rooted in modernist traditions, specifically the Gothic[2].

The Uncanny (217-256), proposed by Sigmund Freud, was the adaptation of his psychoanalytic theory to aesthetics. Freud describes the uncanny etymologically, tracing it to its German root; *unheimlich*. *Unheimlich* is the opposite of *heimlich*. *Heimlich* refers to something that is homely, friendly and familiar while the *unheimlich* is something unfamiliar and unhomely. The unfamiliar makes one uncomfortable and therefore scared, producing horror. The *heimlich* has a second meaning; a secret or something concealed from others.

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2 The Gothic was a type of modernist horror fiction that included works such as Franke*nstein* and *Dracula.* Certain literary theorists understand modernism as a response to changing onditions (of production, economy, industrial revolution, urbanization, etc.), and therefore specifically European.

For Freud, *unheimlich* is not in opposition to this second meaning of *heimlich*. *Heimlich* contains within itself the contradiction of both these meanings. These two meanings are central to understanding the *unheimlich*. The *unheimlich* is something familiar and hidden, and in producing this discomfort becomes central to the aesthetic of horror.

Darko Suvin adapts the concept of the uncanny to SF by describing cognitive estrangement. Bertolt Brecht in *Short Organon for the Theatre* speaks about *verfremdung* (alienation) saying, "A representation which estranges is one which allows us to recognize its subject, but at the same time makes it seem unfamiliar" ("Metamorphosis of Science Fiction" 6). Suvin borrows from Brecht and argues that cognitive estrangement is crucial to understanding SF as a genre. Cognitive estrangement is the "factual reporting of fictions" ("Metamorphosis of Science Fiction" 6).

SF, in the manner by which it uses novums, can separate us from our reality allowing distance from what is being seen, while replicating certain conditions from our surroundings. It describes unfamiliar things in familiar manners, and for Suvin is a genre of revolt because it shows the reader different ways of organizing society. The novum allows the creation of a mythic world with the assumptions of realism. Estrangement occurs at two levels, cognitive and creative which is possible in SF because a detached eye is able to view the uncertainty and unfamiliarity in everyday happenings. It is therefore linked to the formal logic of SF. SF produces a dissonance with conventional 'reality'. As Nodelman says, "Suvin speaks of a common sort of story 'that educates the reader into acceptance of the strange locus and its values by following the puzzled education of a representative protagonist" (27).

The construction of the novums within both of these texts, and for Suvin in nearly all of science fiction, produces estrangement. It does not produce the uncanny (as in the aesthetics of horror fiction), but rather produces cognitive and creative distance from the scientific principles that are made central by the internal logic of a novum. The novum in *Flowers for Algernon* centers a scientific principle of intelligence as its center, while *Holy Fire* establishes a strict codified morality as the organizing principle of the novum. Both of these principles are 'scientific' and estrangement is only made possible through the journey of the protagonists who challenge the established center, which is an extension of 'conventional reality,' in that science and ethics are taken as centers of this world.

Narrative Structure

The antihero in literature was clearly defined during modernism but the concept itself predates this occurrence (Kadiroglu 2). The antihero is usually understood as a character (protagonist) who behaves and acts in ways unlike that of a hero, that is, he has the qualities of a villain. An antihero was understood as a protagonist that was not typically understood as 'good' (hero). Usually, within science fiction the antihero is motivated by self-interest. The antihero prior to modernism was a hero that was flawed and weak and did not possess the traits of a hero within an epic. Within modernism, one of the most prominent examples of the antihero can be found in the writing of Fyodor Dostovesky. In *Notes from Underground,* he centers the figure of an unnamed and ambiguous narrator (Kadiroglu 2). The narrator is seen as a radical existentialist whose anti-social and deviant nature is rejected by society. Edward Wasiolek described this figure as totally free, adding that, "He carries revolt against limitation to its extreme and raises it to a philosophical principle. Like the existentialists who were to follow three-quarters of a century later, he is

en marge; he is in revolt not only against society but also against himself, not once, not only today or tomorrow, but eternally." (411-412)

N. G. Chemyshevski (qtd. in Salma 5) writing around the same time as Dostovesky, argued that the laws of human morality would be discovered and a rational actor would therefore act in accordance with such norms.[3] This rational organization of man's morality and happiness is often contended by the figure of the antihero. Science fiction offers a unique place in which to study this because the newly created norms are necessarily based on such rationality.

The idea of the antihero within postmodernism is slightly different from this notion of the modern antihero. Postmodernism can be broadly understood as the philosophical tendency to destabilize fixed ideas including historical progress as linear, epistemic certainty, presence, and within cultural studies it marks a shift from stable meaning. Jessica Page Morell describes the antihero as "someone who disturbs the reader with his weaknesses yet is sympathetically portrayed and who magnifies the frailties of humanity. An anti-hero often reflects society's confusion and ambivalence about morality" (44). The antihero is not a villain with 'undesirable traits' but instead is a character who shows the ambiguity around the nature of fixed notions within modernism. The postmodern project dislodged the idea of the stable aesthetic and moral values and the antihero in postmodernism comes to reflect such an understanding. The postmodern antihero has a greater potential for demise at the end of a narrative, because the stability of the "myth of progress" is also dislodged by this notion.

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3 Dostovesky's *Underground Man* is understood by Chemyshevski (qtd. In Salma 5) as being a response to the rational organization of happiness.

The figure of Charlie within *Flowers for Algernon* is an example of this postmodern antihero within the context of the ordered novum. The norms of what is accepted within this society are rejected by Charlie after being initially accepted. Initially, while Charlie's IQ is extremely low, he agrees to take part in the experiment although after an increase in his brain capacity, he goes on to reject the conformity that is expected of him as a docile and passive test subject. The revolt against society is seen in the development of isolation within Charlie and his realization that being at either end of intelligence leads to such isolation. Both outcomes for Charlie are equally painful and the idea that a linear growth of intelligence will lead to his own growth is quickly dismissed. While higher intelligence is seen as desirable and established as the essence of the human, in that it is centered and focused upon as the goal of the human, Charlie's interaction with both ends of the spectrum makes him revolt against this very idea and makes him desire freedom. 'Good' self-sacrificial behavior in order to further the advancement of science and allow the growth and understanding of the experiment is rejected by Charlie and he does 'morally ambiguous' actions such as fleeing the conference.

Mia in *Holy Fire* follows a similar journey and after initially desiring the reward of the established ordered morality goes on to reject the 'essence' posited by this new order. Mia exists as a fragmented character. At the beginning of the novel, she is presented as an elderly woman living the ideal life expected of her by a system of medical morality. She is rewarded and regenerated as a 19-year-old. After the surgery, she begins to gradually recall basic memories of how to do tasks and use language and eventually starts relearning her past. Eventually she has the hormones and impulses of a 19-year-old. She embraces her youth, or *holy fire* and despite having adhered to the system of morality she chooses

to go to Europe and reject this ordered system. She rejects the idea that the extension of human life and regeneration is the goal of the subject. Rather, she is focused on interacting with and understanding her own freedom. After seeking the rewards of a rationally ordered novum and morality, she chooses to reject such an order.

Both of these characters highlight the ambiguity and the issue with aiming to establish a central essence of the human or a strict moral system based on science or ethics. Their actions, in subverting the novum's order, produce not an antihero who opposes the notions of the novum by establishing a new center, but instead question the centrality of what is posited. Mia in embracing her holy fire, does not reject the ordered morality by proposing a new moral code.

Charlie's story produces ambiguity by making one question the ordered novum's ability to produce its own desired effects.

The questioning of the central principles around which the novum is ordered is informed by the narrative arc of the hero (antihero protagonist). Campbell argues that almost all narratives are about the hero's journey or what is termed the monomyth. A hero ventures from the mundane and everyday into the world of the supernatural within broader speculative fiction. Within realist and modernist writing, the hero is subservient to the plot which is expected to follow a certain narrative structure. This is an idea that can be traced in continuity to Aristotelian ideas of unity of space, time and action. Campbell argues for the 17 stages of the hero's journey, which can be broadly grouped as departure, initiation, and return (to the ordinary world) (227). This narrative arc and its analysis are broadly a modernist tendency, and the books being studied continue to follow such a narration,

while the protagonists are not what a traditionally hero/antihero is within the modernist narrative.

The departure stage begins in the world of ordinary things, before the element or world of fantasy is introduced. The hero figure is identified and moves into the secondary world/novum through a call to adventure. There is an initial refusal to answer the call, followed by acceptance of the quest, and finally entering the unknown world. With Charlie, this reluctance is hard to identify as when given the opportunity to improve his cognitive abilities, he is quite willing to accept it. Right at the outset, Charlie hopes he is selected for the experiment and is quite eager to take part in it. Similarly, Mia has lived a life in accordance with the principles of the novum until the age of 90. However, within the plot, the call to adventure can be identified later as the moment where she is reborn as a 19-year-old, and her holy fire is rekindled. At this point, it is difficult to identify her as the same character until her memories return. Within the logic of the novum, she then gives into the bodily impulses of the novum as stated by her doctor. The quest of rediscovering her youth is accepted by Mia, despite the reluctance of the earlier 90-year-old version of herself. She then enters the unknown, the world of impulses and freedom when she travels to Europe.

The second stage is that of initiation during which Campbell's hero experiences an ordeal, transformation and reward. Usually, this stage is marked by allies, helpers, a talisman and tests. The talisman, or a gift that is given is extremely clear in both the novels chosen. Charlie is given intelligence, while Mia is given her holy fire and youth. Initially, the doctors and researchers prove to be Charlie's allies. When he encounters the test of social isolation Algernon the mouse proves to be his helper. His test is against the ideal principles of the

novum and his 'duty' to accept these principles and continue to take part in the experiment. Mia's tests are numerous as she encounters various obstacles during her time in Europe. Upon arrival, a certain character, Ulrich steals her bag and she loses her possessions. The gypsies she encounters, the artists in Prague, anarchists, and other friends she makes such as Martin, Emil, and Brett become her allies.

The final stage of return either has reward or reconciliation. Charlie goes back to his lower intelligence and even loses the ability to understand that he will die soon. There is a unique reconciliation and acceptance of his lowered intelligence, which can be seen as the demise that is most likely to happen with the figure of the postmodern antihero. Mia eventually completely accepts this subversive and new world of the youth that is marked by drugs, sex, art, and freedom. Neither of these stages of return are of reward or reconciliation as described by Campbell. This is owing to the fact that the figure of the antihero necessarily differs in their goals from that of a hero. Mainly, in both these books, the antihero protagonist is not one who believes in the sanctity of what is postulated by the novum.

Central Argument

Within both of these texts, the novum posits a specific center which is then challenged by the figure of the antihero protagonist.

In *Flowers for Algernon*, the posited center is that intelligence is a desirable facet of the novum that is brought in through scientific advancement and considered a reward. Charlie himself being the narrator, makes the initial parts of the book slightly difficult to read as the reader is able to understand the bullying and ridicule that he is bearing the brunt of, but within

the logic of the text, Charlie remains oblivious to this social ostracization. He is unable to comprehend why he is being selected for the experiment as well. His desire is to fit in and be able to understand the world better, and because he is excited about what is the central logPost his call to adventure, he willingly obliges. After his intelligence begins to increase, he starts understanding how he was ridiculed and mocked in the past, even by his own family. His intelligence becomes a burden as he begins to feel isolated once he reaches the other side of the intelligence spectrum and is only able to connect with Algernon who is also extremely intelligent. After his intelligence increases, Charlie is able to understand and anticipate that he will die—something the researchers had overlooked. After the increased intelligence, Charlie begins to challenge the logic of the novum. He recognizes that the experiment that was supposed to save him is going to lead to an early death, and that his increased intelligence had led to social isolation again. Further, his attempt at running away from the conference with Algernon is a clear rejection of the novum and its center by the antihero.

In *Holy Fire*, Mia challenges the norms of the established novum by embracing her holy fire and refusing to adhere to the strict codified morality of the gerontocracy. What happens in this text is particularly interesting as the morality arrived at is based on 'scientific reason' and the rejection of this through the story that is constructed and the journey of the protagonist, places larger questions on the nature of science itself. The book has been assessed by Katherine Hayles in her argument about posthumanism, stating that the essence of the human posited by the book is that of life extension (137). However, the antihero Mia, dislodges such an understanding. The book places forth 'holy fire' as an alternative essence of the person. The physical body is not the essence of the human and Hayles, for instance, argues that the book shows us that the human person exists as lived experience folded back into the materiality of the body (137). Like Charlies, Mia accepts the novum

and its center in the beginning but goes on to reject it. A large part of this rejection can be understood through what the doctor states about her surgery and the new body she receives, that while puberty is usually something one has time to get accustomed to, this sudden rebirth into the body of a 19-year-old, makes one more susceptible to acting recklessly as a young person often would.

Both of these texts show antihero protagonists who initially accept and later reject the novum. A narrative similarity can also be seen in the manner by which both texts show a 'rebirth' of the antihero in a manner that is desirable within the logic of the novum. Charlie becomes intelligent, while Mia is rewarded for following the morality of the gerontocracy. Both characters, as they achieve the peak desirable outcome of the novum (whose principles are based on science in both cases), reject the novum. This rejection is done in a postmodern sensibility, in the sense that it does not allow an alternate center to be posited, but raises ambiguity around the established center, rather than simply rejecting the established novum and its center by positing a new center. This is centrally connected to the formal logic of SF writing, as it is the possibility of the novum and the centering of scientific principles and methodology that establish a clear and fixed center which is then displaced by the figure of the antihero. The manner in which the antiheroes subvert the novum is what arguably makes them postmodern.

Conclusion

The narrative arc of the postmodern antihero within *Flowers for Algernon* and *Holy Fire* follow the formal rules of SF, i.e. that which governs the nature of the constructed world within both texts. The protagonists challenge this center by raising questions around the centers of both novums, located as science and ethics respectively, producing cognitive estrangement

through a disruption in the stability around these centers as seen in the journeys of the antiheroes. The questions are raised by morally ambiguous characters who do not offer a strict alternative to the established order, but simply urge us to begin questioning the center itself. The nature of science fiction literature makes this possible in the construction and operation of novums which center scientific principles. Science fiction novels are able to incorporate elements of postmodern story-telling (the antihero arc) and eventually question these stable centers, moving towards posthumanist rejections of the center of the novum[4], i.e., a rejection of the centrality of the scientific principle (and science) around which the story-world is arranged.

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4 Posthumanist rejections include arguing against the physical body as the essence of the human, as shown in Hayles' description of *Holy Fire* (135).

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"A Heavily Edited Timeline": Feminisms, Time Travel and Memory in Annalee Newitz' *The Future of Another Timeline*

Mavis Rodrigues

Abstract

In their uchronian novel, *The Future of Another Timeline*, Annalee Newitz presents a version of history that deviates from existing, known and accepted versions of history. Through the speculative past, present, and future that emerges, Newitz explores feminist concerns. Feminisms, in Newitz' alternate history, are not limited and confined to linear and chronological time, instead, they are intertwined across time. The future affects the present, the present changes the past, and the past shapes the future. The following article examines the position of time travel and memory in relation to the feminist concerns of *The Future of Another Timeline*. Newitz reimagines a feminist past, present, and future through time travel and memory.

Keywords: Time travel, memory, feminism, alternate histories, riot grrrl movement

Introduction

Instead of approaching history through the lens of linear and chronological time, Annalee Newitz' novel *The Future of Another Timeline* posits an alternate understanding of history. History is characterized by change and transformation in the uchronian narrative of *The Future of Another Timeline*. The history of the world within the novel deviates from accepted and existing narratives of history. This deviation from the narratives of history is a consequence of time travel. In the novel, time travel allows people to edit the timeline they live in, thereby destabilizing the temporal categories of past, present, and future. Such a destabilization, in turn, affects the temporality of feminism. The editing of timelines and the subsequent rewriting of memories in *The Future of Another Timeline* creates feminisms that are nonlinear and multidirectional.

The following paper examines Newitz' destabilization of a linear understanding of time and feminism. Following an overview of the uchronian aspects of the text, the paper addresses how Newitz crafts a feminist past, present, and future through time travel and memory. It also explores how time travel and memory work towards destabilizing these very temporal boundaries, creating an experience of time that is fluid and unstable. Through time travel and memory, Newitz explores feminist concerns and movements untethered from a model of linear and chronological time

The Riot Girl Movement: History and Fiction

The riot girl movement (stylised as riot grrrl) started as a cultural and political response to the dominant presence of the heterosexual white male in the alternative and punk music

scene in the United States of America in the 1990s (Wright 53). Unhappy about their systemic exclusion and marginalization from the music scene, women artists, musicians and singers like Allison Wolfe and Molly Neuman of Bratmobile, Kathleen Hanna, Kathi Wilcox and Tobi Vail of Bikini Kill banded together to create an underground feminist movement—the riot grrrl movement. The phrase "riot grrrl" can be traced back to Jean Smith, a musician friend of Kathleen Hanna, who remarked that "we need a girl riot too," in response to the 1991 Mount Pleasant race riots in the United States of America, (Roberts 563). The intentional misspelling of the word "girl" as "grrrl" replicated the sound of a growl, and was an attempt to challenge assumptions and stereotypes of passivity and weakness of girlhood. (Rosenburg and Garofalo 809).

In 1991, the "Riot Girl Manifesto" was published in the zine *Bikini Kill 2*. This one-page long text, articulating the ideals, principles, goals and objectives of the riot girl movement, culminated with the statement: BECAUSE I believe with my whole heart mind body that girls constitute a revolutionary soul force that can, and will change the world for real (Hanna 276). The publication and circulation of the "Riot Girl Manifesto" declared the riot girl movement's commitment to the experiences and voices of women as well as the belief in revolution and change for a better future for women. Another landmark moment in riot girl history was the International Pop Underground Convention, a punk music festival organized by the label K Records in the year 1991 (Rosenburg and Garofalo 810). The opening night, titled "Love Rock Revolution Girl Style Now!" saw a number of all-women bands perform—Bikini Kill, Bratmobile, Kicking Giant, and Heavens to Betsy took to the stage (Hunt). This centering of women's voices and performances would eventually come to be known as "Girls' Night." (Rosenburg and Garofalo 810). From its origins as a movement focused on the creation of "feminist, all-female, mainly-female

punk and alternative bands," the movement extended to challenge the patriarchal and heteronormative standards of society (Wright 53). According to Keenan and Darms, the riot girl movement was directed towards creating a "girl revolution" against capitalism, authoritarian governments, misogyny and homophobia (56). It consisted of politically conscious and socially aware young women who sought to dismantle and rebel against the sexism, homophobia and misogyny of capitalistic society.

Despite its commitment to young women and its attempts to create spaces for girl-centric discourse, the riot girl movement failed to uphold its credo of "Every Girl is a Riot Girl" (Zoladz). The movement, meant to empower girls from all walks of life, was criticized for its exclusionary nature (Briggs 5). Though exclusion and boundaries were intentionally inherent to the riot girl movement, taking the form of zines, meetings, the space at front of the stage at a concert; they also contributed to the exclusion of certain groups of women because of aesthetics, class, race, and age (Keenan and Darms 73). Despite its commitment to all women, the voices of white, cisgender, middle-class educated women were foregrounded, resulting in the underrepresentation and marginalization of black, Asian, Latina, queer, and trans women (Ross 1).

Annalee Newitz' *The Future of Another Timeline* is set against the background of the riot girl movement in the early 1990s. However, the riot girl movement in Newitz' novel differentiates itself from the movement as it unfolded in the reality. Instead of a movement that privileges mainly white, cisgender, middle-class educated women, Newitz' alternate history riot girl movement is diverse, representative and inclusive. In *The Future of Another Timeline*, women of colour fill the stage and occupy spaces in the riot girl movement. This fictional inclusive and intersectional riot girl movement is a crucial setting

in Annalee Newitz' novel. At the centre of Newitz' uchronian fiction are Beth and Tess who are entrenched in the politics, promises and performance of the riot girl movement. Beth, a Jewish middle-class girl, along with her friends—Lizzy (Tess' birth name), Soojin and Heather Sassani, sing along to the songs of their favorite band, the fictional Mexican riot girl band, Grape Ape. Glorious Garcia, the lead singer of Grape Ape, voices the inclusiveness of the riot girl movement in *The Future of Another Timeline* as she sings, "We're rising up we're rising up … I like to see the tall girls / I like to see the short girls / I like to see the fat girls / I like to see the thin girls / I like to see the trans girls / I like to see the cis girls / I like to see the brown girls" (134). In this song, Glorious Garcia voices an inclusive, representative and diverse alternate history of the riot girl movement.

Uchronia: Changing History and Time

The Future of Another Timeline is a uchronian novel. While utopia is used in reference to an ideal society and place, uchronia, on the other hand, is situated in time and temporality. The term uchronia dates back to 1876 when Charles Renouvier coined the word in his novel *Uchronie (L'Utopie dans l'histoire), esquisse historiqueapocryphe du développement de la civilisationeuropéennetelqu'iln'a pas été, telqu'ilauraitpuêtre (Uchronia (Utopia in History), an Apocryphal Sketch of the Development of European Civilization Not as It Was But as It Might Have Been)* (Schmid 26). Uchronia is commonly understood as alternate history or as "the reinvented past" (Saint-Gelais 28). Uchronia, in science fiction, diverges from the known temporal reality to propose a fictional world where the course of history has deviated from accepted and believed history. According to Elisabeth Wesseling, uchronian fiction positions "utopia in history, by imaging an apocryphal course of events, which did not take place, but which might have taken

place" (102). Uchronia entails changes in historical events, "leading to alternative consequences—reality and uchronia bifurcate into different plots" (Schmid 28). The alternate history that emerges in uchronian literature transforms and reinvents the past, resulting in a series of changes in the shape, structure and order of the present, as well as, of the future.

The uchronian narrative of *The Future of Another Timeline* presents a vision of a world where history is changed. In this fictional world of *The Future of Another Timeline*, divergences in history create an alternate temporality where abolitionists and women's suffrage movements remain united in their struggle for human rights, instead of splitting apart following the Civil War, laying the groundwork for the emergence of intersectional feminisms. Universal suffrage was awarded to all citizens at the same time: "The right of citizens of the United States to vote shall not be denied or abridged by the United States or by any State on account of sex, race, color, marital status, or previous condition of servitude" (Newitz 105). As a result of universal suffrage, Senator Harriet Tubman was elected to a position of political power in 1880 (Newitz 106). Despite these changes, this timeline remains marred by racism, sexism, misogyny and homophobia. For instance, Anthony Comstock's Society for the Suppression of Vice's moral crusade against abortion, birth control and female sexuality continues, and constructs a timeline where women are denied their sexual and reproductive rights (Newitz 39). In this alternate history of *The Future of Another Timeline*, the feminism of the riot girl movement is a representative and inclusive feminism that uses music and aesthetics as a way of voicing their protest about the injustices and inequalities of society. Thus, by tweaking and shifting variables in the narrative, Newitz creates an alternate history of a world that is similar and yet different from the one we occupy.

Feminisms in Time Travel and Memory

Time travel adds layers of complexity to the notions of time, temporality and history in *The Future of Another Timeline*. Despite establishing an alternate timeline, the novel argues that even this narrative of history is not set in stone: "Geologists agreed that the timeline was constantly in flux. Travelers exposed to edits returned with memories of lost histories, previous versions of the timeline they had witnessed" (Newitz 34). Therefore, history and time in *The Future of Another Timeline* are susceptible to changes and edits. Through time travel, history becomes endless possibilities and temporality is made fluid. However, in *The Future of Another Timeline*, time travel is governed by regulations that attempt to limit the revision of history. The dominant belief in the world of the novel is that editing the timeline was futile because ultimately, the overarching narratives remain the same—"small things change but big things don't" (Newitz 34). However, Tess, a time traveler who belongs to the secret organisation, Daughters of Harriet, subscribes to yet another alternate understanding of time and history. (Newitz 34).

For the Daughters of Harriet, small changes have the potential to lead up to something bigger and better. They believe that small changes in the past could create a safer world for women, non-binary and trans people (Newitz 34). Thus, the Daughters carry out covert missions, attempting to change history to create a new timeline. The editing and changing of events result in a reshuffling of the timeline, "generating a new history and future in its wake" (Newitz 187). The timeline is, therefore, a "patchwork" of edits (Newitz 198). However, these edits of theirs are often reversed and reverted by another group of time travelers working against them—the Comstockers, an anti-travel and an anti-women activist group of men, the legacy of Anthony Comstock's Society for the Suppression of

Vice. The time travelers of the Daughters of Harriet find themselves in opposition to the Comstockers who wish to maintain a patriarchal world order where women are denied their rights. Thus, the Daughters of Harriet are engaged in an edit war where time and temporality become the grounds on which they attempt a feminist revolution.

Historically, though feminism is neither monolithic nor static since it encompasses a variety of approaches, methodologies, goals and objectives, the developments in feminist thought have mainly been regarded through the lens of chronological and linear time. Reducing feminisms to a series of progressive and sequential phases fails to acknowledge the internal complexities, varieties and possibilities of feminisms. It assumes that only a single dominant mode of feminism is possible at a time (Browne 1). However, such an assumption disregards how feminist thought persists, adapts and transforms over time. Thus, theorists advocate for a plurality of feminisms, as well as, alternate models to describe the temporality of feminisms. In place of a cohesive and linear model of feminisms, they posit "a multidirectional, multilinear model of historical time" of feminism (Browne 23).

The influence of nonlinear temporalities of feminisms is present in *The Future of Another Timeline*. Through time travel and memory, Annalee Newitz posits alternate experiences of the traces, narratives, and timelines of feminisms. Time travel in *The Future of Another Timeline* destabilizes notions of the chronological and linear flow of time. The temporal fluidity calls into question the periodization of women's movements and feminist concerns, the dating of feminist practices and the delineation between schools of feminist thought. Through the literary device of time travel, Newitz liberates feminisms from adhering to a unidirectional temporal flow. The fluidity of time created and emphasized by time

travel equips Newitz with the creative and fictional freedom to address a feminist consciousness that transcends arbitrary boundaries of time.

The movement between the past and the present in *The Future of Another Timeline* presents a complex experience of time and temporality for the time traveler. For the time travelers, the categories of past, present, and future are interchangeable. The time travelers' relationship with time is constantly undergoing restructuring as they travel through time. In returning to the past and occupying space and time in the past, the past becomes the time travelers' immediate present. Thus, the present to which the time traveler belongs becomes their past. When Tess travels from 2022 back to a Grape Ape show in 1992, the past becomes her immediate present, while the present she comes from becomes both the past as well as the future that awaits her younger self (Newitz 15). Time travelers slip in an out of time, thereby, destabilizing notions of "pastness and futurity" (Apter 17). Thus, the temporality of a time traveler is complex and multidirectional, shaped and challenged by their experiences and memories of lived time and remembered time.

This slippage through time acquires a further dimension when one considers the role of memories of timelines past, present and future. Memory and time travel also work in close association to destabilize a linear timeline. Tess explaining the logic of time travel reveals that the edited timeline is a patchwork timeline, consisting of numerous minor edits and changes (Newitz 198). With every edit, the time travelers accumulate memories of the timeline before the edit—of a historical narrative that no longer exists—and each traveler has a different patchwork of memories (Newitz 198). The timeline discarded in favor of the new sequence of events persists only in the memory of the time traveler who was present for the edit, while everybody else lives unaware of and oblivious to the

change (Newitz 142). The travelers remember different timelines, different events, and different histories. Thus, a few time travelers remember an America in which abortion was a legal right, while others do not; some time travelers remember an America without women's suffrage, others do not (Newitz 36, 253).

The act of remembering, the making of memories and the sharing of memories is critical to the establishment of transhistorical feminism in *The Future of Another Timeline*. In a world where some people believe that the timeline cannot be changed and that the time travelers invent fake memories to disrupt and undermine historical narrative, time travelers share their memories of lost histories with each other in an act of solidarity and mutual trust (Newitz 198). Acknowledging and sharing the memories of timelines they remember, the Daughters of Harriet engage in an act of honoring the past that lingers on in traces in the traveler's present. These memories of histories that no longer exist provide the time travelers with a frame of reference to society and time. It allows them to actively engage with the changed and edited timeline.

The time traveler carries with them a complex and convoluted network of memories from different time periods—memories that broach arbitrary boundaries between the temporal categories of the past, present, and future. When the time travelers of the Daughters of Harriet travel in time, they take with them their beliefs and ideologies that have shaped them in the present. Their own present persists in their memory, influencing and determining the necessity of edits for the hope of a feminist future. The time traveler's view of the past is determined through the lens of the present. The complex interaction with time and the persistence of memories creates a temporal experience of feminism that cannot be classified and limited by arbitrary time.

The assumptions and perspectives from the present time condition the time traveler's understanding of the past. The politics of the present determine how the traveler interacts with the past and affects the decisions the traveler makes regarding what changes are necessary to be made to create a better future. Thus, to prevent a bioengineered patriarchal future where women are reduced to reproductive objects, the Daughters of Harriet make an edit to the timeline. In nineteenth-century Chicago, when Anthony Comstock was gaining more political power, the time travelers, along with "New Women and Spiritualists and Midway dancers and anarchists", stood in open rebellion to his moral policing policies (Newitz 117). The refusal to bow down to Comstock's moral policing edited the timeline; it marked divergence in his political fortunes. By editing the timeline, the Daughters of Harriet made Anthony Comstock irrelevant, thereby erasing the anti-travel, anti-women organization of Comstockers from the timeline. Similarly, the realization that the Comstockers were erasing trans women from the timeline, the Daughters of Harriet return to the twentieth century to prevent a hate crime against a trans woman from taking place. Through their editing of history, the Daughters of Harriet attempt to create a timeline where protest, protection and rights are centered. Holding on to the hope of a world that is better and safer for women, non-binary and trans people, they travel in time.

The destabilization of the categories of past, present, and future ensures that feminisms can no longer be restricted to a time period. Instead, feminist practices and movements are revealed to be dynamic and fluid, stretching through time. The feminist concerns explored in the speculative temporality of *The Future of Another Timeline* stretch across and through time. Though reproductive rights are a focal point in the text, other feminist concerns explored in the novel include universal suffrage, communities for women, a universal and transhistorical sisterhood, trans rights and violence against women, and so forth. At a

Spiritualist meeting in Chicago, 1839 C.E. Tess reflects on the existence of an intersectional sisterhood spanning centuries, women united in their desire for a better world for themselves:

> Some were organized subversives, and others were only half-aware that something was wrong in the world. We were fighting for liberation, or revenge, or maybe for a simple night of pleasure without shame. We were fighting to save each other, though we didn't know each other. I thought about everyone else out there, walking this path with us, and wondered what they were doing right now. (113)

Thus, feminism in *The Future of Another Timeline* is not presented as a single limited temporal order, but rather, as timelines and temporalities that are polytemporal, nonlinear, and internally complex.

In *The Future of Another Timeline*, Annalee Newitz shifts between different time periods in order to address the timelessness of feminist consciousness. From the temple of the goddess al-Lat in Raqmu in 13 B.C.E., which offered sanctuary to "women and new genders" who fled their own time period to Morehshin, who travels to the past from her time in 2534 B.C. to curtail the establishment of bioengineered patriarchy, *the Future of Another Timeline* presents a vision of transhistorical feminism that is untethered from linear time. *The Future of Another Timeline* explores the continuities and temporalities of feminisms. Feminisms, in Newitz' alternate history novel, are not limited and confined to their linear and chronological time; instead, they are entwined across time.

Conclusion

In *The Future of Another Timeline*, Annalee Newitz engages in the revision and reinvention of history through the narrative of time travel and memory. As a type of uchronian narrative, *The Future of Another Timeline* posits an alternate timeline of the world where time travel allows for the manipulation of time. Through time travel, history becomes a series of endless possibilities and multiple edits. A static understanding of the past is dismissed by the destabilization of time through time travel. The destabilization of time is central to Annalee Newitz' creation of transhistorical feminisms.

Feminisms, in Newitz' alternate history, are not limited and confined to linear and chronological time. Instead, they are in constant flux across time. Time travel and memory allow Newitz to address alternate understanding and experiences of the traces, narratives, and timelines of feminisms. Since time travel and memory blur the temporal boundaries between the concepts of the present, the past and the future, feminisms undergo a rethinking. Untethered from a linear and chronological experience of time, the traces, narratives, histories, promises, politics and movements of feminisms in *The Future of Another Timeline* spread across time and temporal boundaries. Thus, through the narrative of time travel and memory, Newitz reimagines and recreates a feminist past, present, and future that blend and flow into one another.

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God as Machine: The Evolution of a Distinctive Indian Science Fiction Cinema

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Abstract

In the last two decades the generic conventions of Indian science fiction films have distilled and solidified into a body of easily legible and consumable tropes that are unique to Indian cinema. Religious and mythological themes are more often than not used to buttress the narratives of the technological in these films, giving the genre a cultural credibility and legitimacy and translating its tropes for a domestic audience. By textual analysis of two films—*7aum Arivu* (2011) and *Baar Baar Dekho* (2016)—as examples of the genre, this paper will investigate the bricolage of narrative strategies and audio-visual assemblages that are deployed in the Indian science fiction film and how it intersects with religious and mythological themes.

Keywords: Indian Cinema, Science Fiction, Religion, Mythology

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5 See J.P Telotte's *Science Fiction Film*, Pg. 5&6, for a detailed analysis of how science fiction, as a genre, borrows from generic conventions of horror, western, war films, noir etc

The post liberalization era has seen a marked increase in the production of science fiction films in various regional industries of Indian cinema. While the number of films in this genre remain relatively low, it has seen a rapid increase since the turn of the century. India has emerged as the largest producer of films in the world, putting out nearly 1500-2000 films per year across all its regional industries (Jain, et al.5). While the growth of science fiction as a genre is consistent with the tremendous overall growth that the industry has achieved in recent years, it would be imperative to consider at length the sudden upsurge in the production of these films and the unique generic structure that has evolved around it. Post 2000, science fiction has not only emerged as a bankable genre, attested by films like *2.0* (2018), the most expensive film in the history of Indian cinema and as a vehicle for ideological and cultural battles. This paper seeks to investigate the themes and motifs of the genre and the ways in which they have evolved to reflect both India's current political milieu and its geopolitical ambitions.

Science fiction, even in the West, is a genre marked by great flexibility and hybridity.[5] This natural inclination of the genre for cross genre influences is complicated by Indian cinema's preponderance for genre blending *masala* movies. However, the new global order of increasingly porous and overlapping media markets, transnational citizenry, and even the changing viewing practices of multiplexes and online streaming platforms has forced Indian cinema to move away from the *masala* model and etch out specific markers for each genre. Meheli Sen, in her book *Haunting Bollywood: Gender, Genre and the Supernatural in Hindi Cinema*, refers to this kind of "genre distillation" as a removal of "generic tropes and constellations that are shorn of the local in any recognizable way"(135). While this is true for the few examples of recent Hindi horror movies that she talks about it still does not hold true for the majority of horror, science fiction, and fantasy films

produced in India. While these few films are aimed at an audience that is mostly urban, middle class, multiplex-going, and consumers of global popular culture, the rest of these genres still imbricate with the nebulous borders of the Indian *masala* film.

Taking these imbrications as a given there are still ways in which these genres, especially science fiction, has developed an idiom that is unique to itself and has evolved immediately recognizable, consumable markers of a genre. However, rather than being "shorn of the local ''in this process, these films have codified themselves into an identifiable genre by foregrounding culturally unique aspects such as religion, mythology, and tradition. These religious and mythological aspects are no longer just the culturally specific and conveniently available buttresses that would make what is a "foreign" genre, in terms simply of its availability for consumption so far, more palatable to local audiences, rather they tend to serve a higher ideological function. As we will see in the films discussed below, both thematically and aesthetically, this practice has become so pervasive that the framework of a science fiction movie is almost always a medium to articulate the glory of the past and a need to find a unique Indian philosophy rooted in that past. The victory of the protagonist in the end is also the victory of the truths, values, and wisdom of this mythic past. This is more than a postcolonial impulse to stand up to Western imperialism: in many a film, the West is at once cast in the usual role of the other that must be overcome, but also as a validator, a touchstone that gives legitimacy to the claims of the valorized past.

Anustup Basu posits that the increase in superhero/science fiction films since *Koi Mil Gaya* in 2003 is an indication of the Hindi film industry expanding into foreign and niche markets due to increased financial returns and improved and cheaper technology.

He also considers this "pioneering spirit directed towards breaking new frontiers in the world market" as a brave new way of essaying a "national destinying in the era of transnational information flows and techno-financial development" (558). Basu problematizes the impulse of recent science fiction films to thematically blend science and religion as an attempt to push an agenda of Hindu revivalism, one that has been around since the nationalist struggle but has not been manifested in cinema until now. He argues that these films reconcile the apparently conflicting discourses of myth and scientific modernity by creating certain crucial moments where "...aspects of technology cease to be imprimaturs of science. That is, marks of technologism ...are effectively split from the horizon of 'science' in order to be consigned to an ontotheology of a Hindu revivalism." (569) The deployment of science as a rationalizing agent for religion and religious beliefs is something that has recently been figuring more and more in our political discourse too.

It is not merely through its themes but also through its visual codes and aesthetic choices that the science fiction film articulates religious and mythological agendas. Indian science fiction cinema could be accused of deriving from the West the staple science fiction themes of aliens, mad scientists, and murderous robots but over the past two decades it has developed an aesthetic that is culturally unique to itself. The transnational audience that Indian SF films have garnered is indeed a remarkable achievement, considering the "spectacle lag" between it and its Hollywood counterparts (558). While these spectacles are sometimes overt depictions of Hindu symbols they have now evolved to become the generic markers of Indian SF, just like themes that are drawn from Hindu mythology. A few examples would be the alien, Jadoo, in *Koi Mil Gaya*, who is modeled after Lord Krishna (Khan), the spaceship in *Joker* (2102) which is shaped like a Shiva linga, and robots which are presented

as divine beings by attiring them as traditional deities as in *Enthiran* (2010), or foregrounding them in front of idols of gods or demons as in *Ra.One* (2011). This effect is reinforced by the plot and background music too. For example, the robot in *Enthiran* is greeted by people prostrating themselves at his feet and crying out in prayer and the robot in *Ra.One* stops a runaway train, coming to rest at the feet of a huge Ganesha idol to rousing chants of "Ganapati Bappa Moriya" in the background. This conflation of the scientific and the divine is doubly effective and believable as these characters are portrayed onscreen by superstars who are venerated as quasi divine off screen too.

The science fiction films of the new millennium are fascinating not only because of the diegetic and aesthetic choices that they make but also because of the spaces in which they choose to locate them and the movement of the characters in them. Many of these films, usually Hindi and Tamil-which are the most successful languages in this genre, are either set in part in foreign countries or have antagonists/protagonists who travel to India from somewhere outside. The locations are usually those with a sizeable diasporic population of Indians, like UK (*BaarBaar Dekho*) USA (*Ra.One, Dasavatharam, Joker*), and Australia (*Love Story 2050*), Canada (*Koi Mil Gaya*), or South East Asian Countries (*IruMugan, Krrish*). Science fiction films are therefore furthering a transnational cosmopolitanism that seeks to bring in a global Indian audience and unite them being invested in a portrayal of India that is identifiable to the diasporas and aspirational to the local audience. The geopolitical ambitions of Indian science fiction cinema are not limited to these strategies of identification and aspiration that arguably increase the market for these films overseas, thereby increasing the opportunities for improving the much touted soft power of Indian cinema. These ambitions also lie in the narrative positioning of India as a global player able to hold its own in terms of science and technology against external

aggressors and foreign antagonists, most notably China (*7aum Arivu, Tik Tik Tik*) and the USA (*Dasavatharam*).

The two films I would like to look at more closely are emblematic of the above discussed characteristics that define Indian science fiction cinema today. *7aum Arivu* (transl. Seventh Sense) is a 2011 Tamil science fiction film directed by AR Murugadoss. The film follows Arvind (Suriya), a circus artist, and Subha (Shruti Haasan), a genetics student, who tries to revive the powers of the ancient Buddhist monk Bodhidharma (Suriya) through Arvind who is his descendant. These efforts pit them against a Chinese superspy Dong Lee who is sent to India on a mission to spread a deadly virus in India and to kill Subha whose research might be an obstacle to China's designs to control India through bio-war.

The film starts with the tale of Bodhidharman, a prince of the Pallava dynasty, who leaves his city of Kanchi to travel to China on the orders of the Queen Mother. He adopts a village in China, rescuing it from a plague and ravaging marauders, and passes on to its inhabitants his vast knowledge of martial arts and medicine. Many years later, on expressing a wish to return to his country, the villagers try to poison Bodhidharman in the belief that the land where he is buried will not be affected by any diseases. He accepts the poison and dies in his adopted village which later becomes the famed Shaolin temple in China. The narrative then shifts to a documentary style where people on the streets are asked if they know who Bodhidharman is. None of the people in Tamil Nadu know his name while all the people in China do. The narrator talks about how none of us know an Indian, a Tamilian, who is worshipped in his countless temples all

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6 Translation done by author.

over China, Japan, and Taiwan. The camera cuts to web pages, including Wikipedia, which highlight the parts which mention Bodhidharman as an Indian and as the founder of the Shaolin Temple.

The film continues to play on this trope of lost ancient knowledge that is somehow appreciated and utilized in other countries but of which Indians are sadly ignorant. To recruit Arvind to her project of reawakening this ancient knowledge through the modern science of genetics, Subha takes him to a museum where she tries to impress upon him the value of this lost knowledge.

> **Subha**: *Everything on display here has a story behind it. We are not the real citizens of this country. Thousands of years ago, the people who taught this country bravery and pride were the true citizens of this country. They were 500 years more advanced than today's modern science. Scientists have discovered that there are 9 planets using Space Theory. They are saying this by observing space through telescopes. How did ancient Indians know to worship nine planets, Navagraha, in temples? How did Aryabhatta calculate the radius of earth 1200 years ago? Modern weather forecasts cannot even predict rainfall correctly. How can people look at the Panchang and predict amavasi and poornima years in advance? This is 'our science'.*(*7aum Arivu*67:50- 69)[6]

The rest of the film sees the protagonists in a race against a rampaging epidemic, similar to the one Bodhidharman had cured aeons ago in China, the antidote to which is known only to the Chinese and a Chinese superspy as they combine ancient texts and

modern technology to awaken Arvind's genetic memory which would be the key to protecting the land and its people from a devastating biowar. At the end of the film the speech given by Arvind, who is now celebrated by the media for having cured the plague, in a television interview sums up its message succinctly:

Arvind: *We have to know our history. Only by knowing history we will know our senses. Those who have ruled us have hidden the stories of our bravery and pride somewhere. By changing our religion, language and traditions they have hidden our identity.* (*7aum Arivu* 153- 153:16)

He goes on to give scientific explanations for a number of rituals and explains how other countries are getting ahead because the new generation has forgotten all this:

Arvind: *The saints and yogis are still alive in our blood and our beliefs. We don't have to conduct research on it, we just have to take their knowledge forward.* (*7aum Arivu* 154:21- 154:33)

7aum Arivu mythologizes a historical figure and an ancient system of knowledge, valorizing it as having far reaching consequences into the future. The film starts off by establishing the ancient Pallava kingdom as a place of learning, science, and martial excellence, all of which were transferred by an altruistic prince to an alien community in distress. His own people however lost that knowledge because of a tyrannical imposition of rulers, ostensibly outsiders, who sought to destroy this knowledge by changing their "religion, language and traditions" thereby denying them their true identity. The film calls for a return to that unsullied and glorious past as the only way to survive in a world that has seemingly advanced because of "our" knowledge.

The film legitimizes these claims by juxtaposing the narratives of ancient wisdom with objective, modern, scientific "proofs". The narrative about Bodhidharman being revered in many Asian countries as the founder of the Shaolin school is intercut with Wikipedia pages and on location shots of Buddhist monasteries. The reverence for Bodhidharman in those countries is juxtaposed with the pitiful ignorance of Indians about this "national" hero, and is shot in a documentary style, one that is associated with objectivity and truth. Subha steals Bodhidharman's book from a museum and brings Arvind to one to educate him about the past, establishing the narrative as truth by using the understanding of the museum as a site for an objective, scientifically verified history. The science of genetics is used as a modern tool that can help us access if not understand a higher truth that was lost by invasions and impositions left unmentioned. It is crucial that the film equates this reclamation of knowledge to a reclamation of a lost monolithic identity. A reclamation that would establish India as a redoubtable modern political power with the legitimacy of a genuine classicism of science, martial prowess, and nationhood behind it. The existence of the country in the present as a utopic space of strength and prosperity could only be realized by the revival of the ancient systems of beliefs, knowledge and traditions.

The evoking of a classical, monolithic, Hindu past as a lost utopia that is to be revived in order to flourish is a recurring theme in Indian science fiction. In certain cases the argument for this revival is made directly by the diegesis of the film. In *BaarBaar Dekho* (2016), directed by Nitya Mehra, Jai, a mathematics scholar who questions the logic of rituals and traditions is forced to skip ahead into his own future at accelerating rates by a sacred thread that is tied onto his wrist by a mystical *pundit*. Jai, who is about to marry his longtime girlfriend, receives an offer from his old professor in Cambridge to

pursue his research in Vedic mathematics. The film pitches Vedic mathematics as something that would have a tremendous impact on space travel, the professor encouraging him to take it up as "the answers to the future lie in the past . . . " (*BaarBaar Dekho* 20:59-21:02). The dilemma of the protagonist in choosing between a future in England doing his research and a future with his traditional girlfriend and her comically absurd religious family is solved by time travel, a science fiction staple, albeit done without a time machine but using a sacred thread. As Jai skips forward into the future, the setting shifts to London where he focuses on his job ignoring his family. Even cutting away the thread does not seem to affect his inadvertent time travelling. As he lives out his entire life in a few days decades apart, Jai realizes his mistakes and his loss and the realization helps him get back to the present and go ahead with his marriage.

Though the film has absolutely nothing in it other than time travel that could classify it as science fiction, it was still marketed as and is considered a science fiction film. The concept of time travel with a sacred thread (and inexplicably without it) underlines the uniqueness of this chimerical assemblage that is Indian science fiction. The novum, conceptualized by Darko Suvin as a scientifically plausible element that is central to the plot of any science fiction narrative and which drastically changes the world it is situated in is not at all scientific in this instance. It does, however, throw into relief the sociocultural impulses of its birth—a dialectical opposition between tradition, characterized by familial bliss and fulfilment, and an overreaching and ultimately doomed ambition fueled by disdain for the truths and wisdom of tradition signified by the spare impersonal London of the future. The film is not concerned with giving its narrative over to logical explanations; rather, it leaves questions of understanding well beyond the ability of science or logic in a truth that is to be implicitly believed in rather than reasoned out. This truth which is intimately

tied to rituals and traditions of the mystical *pandit* is the knowledge that is to be revived or at least lived with to make meaning in a life that would otherwise only alienate the ones living it.

Dominic Alessio and Jessica Langer in their essay, "Nationalism and Postcolonialism in Indian Science Fiction: Bollywood's *Koi . . . Mil Gaya"* (2003) analyze the religious motifs in the film such as the semi divine alien modelled after Lord Krishna, the universally recognizable "OM" sound that contacts the aliens and the OM shaped spaceship of the aliens as evidence that the film itself is a piece of overt propaganda. Citing that the film was lauded by the BJP, the party ruling at that time, and the fact that its songs were used in the BJP's elelction campaign, they allege that "It seems, therefore, that *KMG* has aligned itself both formally and ideologically with extremist Hindu nationalism, combining formal elements from Hollywood SF and from Hindu religious iconography to reinforce a nationalist cultural hegemony" (168). They see the inclusion of Hindu myth and religion in the film as a conscious political choice rather than an apparent manifestation of the very dynamics of the collective/national imagination, the roots and rationale of which run much deeper. Ericka Hoagland and Reema Sarwal, in their introduction to the book *Science Fiction, Imperialism and the Third World*: *Essays on Postcolonial Literature and Film*, describe SF as "a genre that feeds off of conflicting impulses—of exploration and xenophobia, conquest and exchange, and technophilia and technophobia, to name a few" (9). This holds true for Indian science fiction as well as it navigates conflicting impulses of post colonialism and geopolitical ambitions, a glorious past and future progress, technology and faith, and science and religion. What is evident is that the intertwining of science and religion to envisage a monolithic Hindu nationalist utopia

rooted in a classical past of advanced scientific knowledge and traditional "Indian" values is being articulated consistently through science fiction cinema in the new millennium. The above examples enumerate how religious symbology and mythical themes are entwined in the narratives of science fiction. The examples of *7aum Arivu* and *Baar Baar Dekho* show that the prevalence of myth and religion are not limited to a superficial, visual level but dictate the core characteristics of the genre of Indian science fiction.

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The Structure of 'Scientifiction': Thought Experiments in SF by Indian Scientists[1]

Ankit Prasad

Abstract

The study of English-language science fiction (SF) from India has primarily focused on SF by non-scientists. However, Indian scientists *have* been producing SF in English, though of a different kind. Moulded by the (stated) motivations of Gernsbackian 'scientifiction' and utilizing the short story format, this kind of SF usually employs a scientific principle and explicates it through a fictional narrative. This combination is analogous to the scientific hypothesis and may be understood as a literary-scientific 'thought experiment'. This sub-genre of Indian SF is typically marketed as 'educational' literature under the banner of Popular Science. My paper will study SF short stories by two Indian scientists: astrophysicist Jayant Narlikar's 'The Rare Idol of Ganesha' (2015), and zoologist Sukanya Datta's 'When the Tide Turns'(2006). In the individual analyses, I will identify the thought experiment involved, its centrality to the narrative, and the questions opened up by its employment within the narrative. By showing that SF can be fruitfully studied through an explication of the thought experiments it engages in, I will suggest that this method of analysis can be useful for studying Indian SF by scientist-authors, including those who do not write in English.

Keywords: Indian SF, thought experiment, Jayant Narlikar, Sukanya Datta

In recent years, Indian Science Fiction in English has generated increasing interest among scholars. Suparno Banerjee and Sami Ahmad Khan have produced book-length works[2] on the field. While they have laid out the contours of the field, the texts they analyze pertain mostly to works by non-scientists. This is important to note because Indian scientists have not only played a significant role in the early Indian SF produced in the late-nineteenth century but they also continue to produce SF in English.

In this essay, I will study the SF of two Indian scientists: astrophysicist Jayant Narlikar's 'The Rare Idol of Ganesha'(2015)[32], and zoologist Sukanya Datta's 'When the Tide Turns'(2006). My aim is to show that these texts are structured differently from mainstream Indian SF in English.

What If?: Thought Experiments and SF

The term 'thought experiment' is considered to have been coined first in German ('Gedankenexperiment') by Danish physicist and chemist Hans-Christian Orsted in 1812 (Witt-Hansen; Stuart et al. 1). A thought experiment is a method of considering a problem and *thinking through* its consequences. Though there have been debates about both its point of origin and relevance to non-scientific disciplines, it continues to be utilized in various disciplines[34].

Due to its broader definition as a method of speculating a hypothesis and considering its implications, thought experiments seem to have an affinity with how SF works. Vandana Singh, for instance, has described how speculative fiction is basically structured around

one or many thought experiments or 'what if' scenarios (Singh 202). If we take this line of thinking, it would imply that SF texts can be distinguished based on the nature of the thought experiment they engage in. I will return to this question at the end of the essay. Let us now look at the two texts under consideration. In the analysis that follows, I will identify the thought experiment involved, its centrality to the narrative, and the questions opened up by its employment within the narrative. This will be followed by broader considerations about Indian SF.

"The Rare Idol of Ganesha"

Narlikar's story starts with a cricketer—Pramod Rangnekar—playing his last match for India. Against all expectations, he decides to bowl with his left arm, performs exceptionally, wins the game for India, and almost immediately exits the stadium in an unidentified car. As the narrative proceeds, the narrator figures out that due to an experiment performed on him by their mutual friend, Ajit, Pramod's physiology had become a mirror image of himself, thus providing him with the ability to bowl as efficiently as he does with what had earlier been his 'weak' arm.

The thought experiment at the center of the narrative revolves around the Einsteinian modification of Euclidean geometry. In 1915, Einstein theorized that "massive gravitating objects have non-Euclidean geometries around them," thus establishing that "Euclid's geometry need not be the only logically consistent geometry." This became an acceptable theory later in the century when experiments with light rays confirmed the equations. Through his mouthpiece scientist character, Ajit, Narlikar adds to this the differing

perspectives of different dimensions through the concept of the 'twist' in the Mobius strip, later departing from Einstein's theory to speculate on the 'spin' of subatomic particles (9).

In "The Rare Idol of Ganesha," the thought experiment—the 'what if' question—structures the central motif of the story: the idea of embodying one's own mirror-image. On the surface, Ajit's experiment seems to be merely about a physiological change, about witnessing one's 'other side'(10). However, it is not a coincidence that the two characters–Pramod and Ajit – who undergo the change are dissatisfied in their respective professions. Pramod is aware of the decline in his cricketing ability and wants it back. Similarly, Ajit feels disillusioned in the bureaucratic structure of the government lab and wants to return to the free spirit of inquiry of his Cambridge days. In a sense, both characters want to embody their younger self, a self that has now become an 'other'. This dissatisfaction echoes the dissatisfaction with existing theories that gave rise to Einstein's modification of Euclidean geometry, the idea of 'spin' incorporated into the model of the Mobius strip, and Narlikar's thought experiment which combines the two ideas.

After John realizes the truth about Ajit's experimentation on Pramod, he immediately considers the following: 'Was it real Pramod or was it his image?'(8). A large part of how we understand and perceive ourselves – our identity – and others depends on seemingly trivial aspects, like being right-handed or left-handed. The story invites speculation that if, like Pramod and Ajit, we were to experience being our 'mirror-images' for a while, what would it do to our perception of ourselves? Would it enhance and enrich our experience of life, breaking us out of our limits? Or would it destabilize our identification with ourselves to such a degree that it would be difficult to live with ourselves?[54]

In the story, both Pramod's and Ajit's transformations are sudden, almost instantaneous. The effect of this is palpable. On the morning after his transformation, Pramod "felt weak, could not read, found letters inside out" (12). Similarly, Ajit's experience is one of not being able to read writing or open a bottle. Moreover, his brain's hemispheres swap place and his heart beats on the right side of his chest. In both Pramod and Ajit, the effects are simultaneously physiological and psychological. However, their instincts remain the same. In fact, it is the persistence of their instincts that make it difficult for them to adjust to the new state of being. For Ajit, his instinctive right-handedness creates the awkward situation of him not being able to sign a book for John's son, Ken. He is also unable to eat with a knife and a fork. Ironically, Pramod's left-arm bowling is so difficult to read precisely because his instinct of being a right-arm bowler persists in the face of this change. As Ajit explains, "Suppose I turned him into his reflection? I thought he would bowl as a left-hander but not as an ordinary left-handed bowler would. All his actions would be that of a right-hander reflected in the mirror" (12).

Finally, the story subtly warns against excesses in scientific experimentations. For this, the transformation of the Ganesha idol is used as a symbol for the 'other' side. Though the very sustenance of Narlikar's thought experiment is based on modifying existing theories, Ajit's ultimate fate presents the flip side of this dynamic. Ajit is obsessed with correcting the 'flaw' in his experiment even after John warns him against "playing with unknown laws of nature" (13). Ajit's incomprehension and unwillingness to heed this advice ultimately leads to the tragic ending wherein both the records of the experiment and Ajit's memory are wiped out entirely. After giving life to his experiment, Ajit is focused only on the technical aspects of the experiment. The idol of Ganesha that Ajit leaves with John as a proof of his experiment is the only thing that remains of the experiment at the end of the story. As

Narlikar explains while writing about the story, it is common for Ganesha idols (an overwhelming majority of which display a benign figure) to have the trunk face the left. Moreover, though "[t]here are rare idols where his trunk is turned to the right[,] [u]sually […] this version shows Ganesha in an angry or aggressive mood" (130), The 'rare' idol, with a benign face but with its trunk turned to the right, becomes a symbol of the 'other side' of scientific inquiry—the desire to play God.

"When The Tide Turns"

While Narlikar's story is set in contemporary times, Datta's story is set in the 23rd century. It portrays a world on the brink of catastrophe where inequality and marginalization continue unabated. Individuals with different skin pigmentation are the "object of cruel curiosity," and people with "physical and mental disabilities" (1) are treated as unequal. There seems to be no public knowledge about the fact that in twenty years, food production will suffer irreparable damage all over the world. Against the backdrop of this last fact, a group of scientists prepare themselves for survival.

The thought experiment at the center of the narrative revolves around preadaptation. In evolutionary biology, 'preadaptation' generally refers to "a structure that happens to be able to evolve some new function with little change in structure" (Ridley 264). An organism may possess certain features that, with time, take on a function that they did not previously have. The most wonderful example of this are birds' feathers. It is conjectured that feathers initially evolved for functions other than flight, like thermoregulation. However, with evolution, they became adapted for flight. Thus, bird feathers were preadapted. There are two competing views on preadaptation. The classical view[65] is that preadaptation was a

part of those mutations that were caused by major saltations[67] – sudden changes in the traits of an organism's characteristics that adapted it to the new environment. However, more recently, the saltational concept of preadaptation has been rejected by those who consider evolution to be a continuous and gradual process. In this view, preadaptation is seen as a process by which both the earlier and the new function continue to have prominence (Mayr 356, 100).

"When The Tide Turns" concerns a preadaptation thought experiment wherein albinism becomes a preadapted trait for human survival. Dr Pinctada's research on chloroplasts, which had initially resulted in an agricultural boom, took on prominence and a new impetus when she realized the crisis of food depletion that was approaching. Datta suggests that the crisis was a result of the blind dependence on science and the uncontrolled mining of the possibilities it provided. As humans "whipped the land to produce more and more" while simultaneously "disregard[ing] […] natural biological webs and chains," the land slowly turned barren and refused to yield any more. Dr Pinctada's research on artificial chloroplasts did help in stalling the crisis by temporarily quadrupling the yield, but it was capable only of deferring defeat. Dr Pinctada's research after this point involved experimenting with artificial chloroplasts on human skin. In a world where food production was going to be impossible, she planned to make humans directly dependent on the sun for their energy needs, analogous to how plants survived.

The catch in this experiment was the melanin that is present in varying degrees in 'normal' human beings. Melanin, Dr Pinctada finds, makes it impossible for sunlight to penetrate, thus not activating the chloroplasts in the skin. The only humans who could undergo this experiment successfully were those who had no melanin in their skin, i.e.

albinos. It is thus Dr Pinctada and her research group of albinos who survive the man-made apocalypse.

In this story too, the thought experiment structures the central motif of the story, represented by the mistreatment of albinos like Rukun. Datta successfully combines two major contemporary issues—the stress placed on food resources and discrimination on the basis of skin pigmentation. The story ends by implying a future world where both practices turn on their head, changing the dynamic of human survival. In the sequel to the story, "The Tide Turns Again," we see a glimpse of this world. The new species does not require food ingestion, and after a few generations, the digestive system, which now has no use, also disintegrates. Individuals consciously ingest water once a day and 'charge' themselves by exposing their skin to sunlight. In any case, at the end of "When the Tide Turns," Datta seems to argue that it is the most discriminated against (albinos) that turn out to be preadapted for survival.

The story may be read differently. First, the process of transplanting chloroplasts into human DNA is not a 'natural' process but an 'experiment'. It is fundamentally different from the preadaptation that bird feathers represent. Second, and relatedly, the process takes place suddenly, again in contrast to the way bird feathers change their function over a long period of time. Finally, the process is different in being *intentional* and *directed*. In the story, Dr Galling recalls how preadaptation "is a shot in the dark[,] and if it hits bulls-eye, survival is the jackpot it earns" (12). The element of chance that seems to be central to the whole process runs contrary to the intentionality of Dr Pinctada's experiment. In this respect, it is worth focusing on an aspect of the story that may well be a subtext.

The story makes it clear that Dr Pinctada is an albino and that she has suffered discrimination as a young scientist. At the end of the story, as a distraught Dr Galling makes his way back to a disintegrating world, he "had a vision of another Dr Pinctada being dismissed like he had been" (14). The fact that the breakthrough experiment comes from such a scientist shows both that science is not 'universal' or 'indiscriminate'. The practice of science can be every bit as directed and discriminatory as 'orthodox' and 'unscientific' practices. Thus, should we not see Dr Pinctada's experiment as an *intentional* valorisation of a community that has been historically discriminated against? This is not to say that her experiment is intentionally discriminatory or that she is plotting the erasure of all other humans. This would be too simplistic and not bear out the logic of the story. Instead, I suggest that the fact that Dr Pinctada could think of such a solution to the issue lies in the way she thinks and in her experiences. This can be seen even in her broader research interest—chloroplasts—presumably developed as a young student when this crisis would not have been recognized by anyone, least of all by her. If one were allowed to be anachronistic, chloroplasts could be described to be located on the 'skin' of plants. Like melanin in humans, one of its functions is to provide colour to the plant—it is due to the presence of chloroplasts that most plants look green. Dr Pinctada's interest in chloroplasts could arguably be imputed to her experience of growing up as an albino and a general sensitivity towards skin pigmentation. The normalization of certain characteristics usually invisibilizes its existence, making it the norm. The critical study of such characteristics usually come from the margins of this 'normal' system. For instance, Critical Whiteness Studies (CWS), "a growing field of scholarship whose aim is to reveal the invisible structures that produce and reproduce white supremacy and privilege," was brought into existence by black scholars and writers (Applebaum).

Such a reading can also be borne out by subtle hints strewn across the story. One such instance is Dr Galling feeling that Dr Rukun (the same character who had 'disappeared' as a young child) always spoke to him with pity and a sense of superiority. This reversal of the dominant narrative (where a person of 'normal' pigmentation like Dr Galling would behave condescendingly towards Rukun, an albino) mirrors the title of the story—"When the Tide Turns." The title also seems to signal that this 'turn' in societal arrangement is as 'natural' as the flow of tidal waves. However, my reading of the story tries to argue that when 'science', along with its history and human intentionality, comes into the picture, this metaphor of 'natural' processes is destabilized. The turning of the tide is not a neutral act; it is engineered. Dr Pinctada's experiment exemplifies this.

Conclusion: 'Scientifiction'

Two aspects stand out about the two stories examined in this paper. First, as I have shown, they are structured around a thought experiment that speculates about the implications of one or more scientific theories. Second, both stories explain the theory within the narrative itself. The characters of John and Dr Galling represent the presumably unassuming and naïve reader, who comes to learn about the scientific theory at the center of the narrative. Thus, the story becomes a vehicle for an explanation of the theory in an engaging manner. Narlikar confirms as much when he writes that for him, "science fiction is a means of introducing science to the lay reader" (127). This aspect of these stories distinguishes it from Indian SF by non-scientists. To take just a couple of examples, neither Manjula Padmanabhan's *Harvest* (1998) nor Samit Basu's *Chosen Spirits* (2020) engage in the explication of any scientific principle. Instead, it is possible to argue that broadly, Indian SF by non-scientists engages in thought experiments about sociological principles.

According to Gautam Shenoy, SF by Indian scientists, by being engaged in an explanatory process, harks back to an earlier tradition of 'scientifiction'[87]. The term was introduced by Hugo Gernsback to describe "a charming romance intermingled with scientific fact and prophetic vision." This kind of fiction was supposed to educate the masses in an era which was experiencing huge scientific changes. It is another matter that the vast volume of the stories actually published by Gernsback did not live up to the professed manifesto. However, in the context of post-independence India, it is perhaps more appropriate to see Narlikar's and Datta's stories as part of the move to disseminate scientific knowledge and encourage the development of 'scientific temper' among the layperson. In this regard, it is noteworthy that Datta's collection of short stories is advertised as 'Popular Science' by the publisher, National Book Trust (recall Narlikar's statement about the "lay reader" above). Both Datta and Narlikar have also written numerous non-fiction titles, including for a young audience. Taking all of these factors into account, it becomes clear that SF by Indian scientists is different from mainstream Indian English SF not only in tone and content but also in the kind of audience it targets.

While pointing out the dearth of good criticism on SF in India, Narlikar suggests that "many literary experts are afraid of the technical envelope around the sciences. Starting out with the premise that they will not understand the science on which the fiction rests, they are unable to write a reasonable literary criticism" (141). Of course, the emergence of critical methods and pathways like medical humanities and memory studies, and interdisciplinary and transdisciplinary enquiries would appear to give the lie to this statement. However, even though such kinds of perspectives exist, they have largely not been used to study the SF of Indian scientists[9]. As a researcher with a humanities background but with a growing interest in SF studies, I have attempted to engage with this Narlikar's

complaint. I have aimed to show that SF can be fruitfully studied through an explication of the 'thought experiments' it engages in. It may seem that this kind of analysis necessarily requires a certain amount of grounding in the scientific principles being explicated. Consequently, as Narlikar points out, critics with a core training in the humanities may find this method daunting. However, as I hope this essay shows, the preliminary task is not very different from the 'philosophy' reading that literature scholars often embark upon while attempting to analyze a text. The crucial factor is not a deep grounding in the natural sciences but a commitment to exploring the way scientific theories have been narrativized through a work of fiction.

Narlikar rues the dearth of good SF criticism specifically in the context of Marathi SF. Most of his SF was originally written in Marathi, and some, including the story analyzed here, were later translated into English by him. Similarly, though Datta writes in English, her SF seems to follow in the tradition of Bengali Bangla SF[108]. Bodhisattva Chattopadhyay has pointed out that it is more appropriate to term Bengali Bangla and Marathi SF 'kalpavigyan'[11], with the added implication that it may apply to SF in other regional languages too. This argument is strengthened by the fact that most of the regional languages of India share root-words and concepts: hence, the central applicable terms, 'kalpa' and 'vigyan', can be similarly parsed through the different languages. Moreover, India's regional SF has been argued to be different from its English-language SF (Chattopadhyay). Thus, a common terminology could provide a common ground for the different SF traditions in India, paving the way for more compelling comparative studies in the future.

Moreover, India's regional SF has been argued to be different from its English-language SF (Chattopadhyay). Further, it is interesting to note that regional SF is

predominantly written by scientists.[9]. The reasons for this require further, nuanced study, but one reason is the fact that SF writing in the regional languages is an attempt, in the same way as popular science books, to make scientific knowledge more easily accessible to the public. SF in the regional languages seems to have a more instructive bent, which would explain why so much of such writing is targeted towards a younger age group. Often, these books are published under the label of Popular Science, showing the marketing desire to capture the imagination of young adults and inspire them to take up a career in science. To achieve such an end, it is no surprise that it is scientists who write these books[12]. In the light of this, it would be worth further investigating if SF by Indian scientists, originally written in any language, may be studied as thought experiments that explicate a scientific theory.

Notes

1. The initial spark for this essay was inspired by an article by Gautam Shenoy. See Shenoy.

2. The texts referred to here are Banerjee's 'Other Tomorrows: Postcoloniality, Science Fiction and India' (2010) and Khan's 'Star Warriors of the Modern Raj: A Critical Study of Science Fiction in Indian English (SFIE)' (2015), both unpublished PhD thesis at the time of writing this essay. Since then, both have published a book each: Banerjee's *Indian Science Fiction: Patterns, History and Hybridity* (2021) and Khan's *Star Warriors of the Modern Raj: Materiality, Mythology and Technology of Indian Science Fiction* (2021). Urvashi Kuhad's *Science Fiction and Indian Women Writers* (2021) is another recent contribution to the field. None of these, however, address the specific question of the kind of SF written by Indian scientists.

32. The story was originally published in Marathi. It was first published in English (Narlikar). Since Narlikar has translated the text himself and it appears alongside a novella originally written in Engllish, I have chosen to treat it as an independent work in English rather than a translation.

43. See the 'Introduction' to Stuart et al. for a summary of these debates and a discussion of the disciplines that make use of thought experiments.

54. A related line of inquiry can relate this story to the famous 'Ship of Theseus' thought experiment. For a non-SF narrative that exploits this thought experiment as a structuring principle, see Anand Gandhi's *Ship of Theseus* (2012).

65. Held by, among others, Lucien Cuenot, the French biologist who coined the term 'preadaptation'.

76. From the Latin 'saltus', meaning 'leap'.

87. A contraction of the term 'scientific fiction'. See Shenoy.

98. In this respect, see the unique methodology used by Sami Ahmad Khan in *Star Warriors* (2021), where perspectives from Chaos Theory among other ideas are used to study and contextualize SF as 'world literature'. For instance, the stories featuring Lucky Shome seem directly in the line of Bangla SF that mixes a detective story with scientific explanations, like Premendra Mitra's Ghanada tales and Satyajit Ray's Professor Shonku stories.

10. For instance, the stories featuring Lucky Shome seem directly in the line of Bangla SF that mixes a detective story with scientific explanations, like Premendra Mitra's Ghanada tales and Satyajit Ray's Professor Shonku stories.

11. In Bangla, 'kalpavigyan', coined by Adrish Bardhan, is the preferred term for SF. It involves a complex combination of the terms 'kalpa' – both a unit of time and a shorter form of 'kalpana' (commonly understood as 'imagination') – and 'vigyan' – knowledge of the material world, or 'science'. Kalpavigyan is 'a type of literary production that draws upon the natural sciences or the scientific method' for narrative use (Chattopadhyay).

129. Apart from Narlikar, most of whose SF is in Marathi, some other scientists whose work is notable in this regard are Jagadish Chandra Bose (Bangla), Devendra Mewari (Hindi), Bal Phondke (Marathi), and Dinesh Chandra Goswami (Asamiya). Also For a representative idea of the same, ssee Shenoy and the contributors list in Phondke.

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