

Temporal Mechanics in Mandel's Sea of Tranquility

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ABSTRACT

This research explores the logical and metaphysical possibilities of time travel, a concept that has long fascinated humanity. Central to this inquiry is the theory of closed world lines, which suggests that physical objects may trace self-contained temporal paths. Drawing on Verne's scientific perspective and Mallet's experimental work on time travel, the study examines the relevance of modern space-time theories—particularly relativity—which appear to allow models featuring closed world lines. The exploration of time travel challenges the understanding of the future and its potential consequences for human lives. A key text in this investigation is the novel Sea of Tranquility, which plays a pivotal role in addressing the complexities of time. The narrative weaves together past, present, and future through non-linear storytelling, touching upon concepts such as time dilation and the manipulation of temporal and spatial dimensions. The novel's intricate depiction of temporal relationships offers valuable insights into the potential impact of futuristic technology on human lives and society. Through its exploration of time travel, Sea of Tranquility provides a nuanced portrayal of human experience in the modern world. The study also draws connections between science fiction and the real world, emphasizing the boundaries of innovation and the relentless human spirit that ventures into the unknown. Furthermore, it highlights how science fiction can serve as a metaphor for the dehumanizing and often chaotic effects of technology, as it threatens to consume human lives and blur the essence of reality. This research applies the theoretical frameworks of physics and philosophy to interpret and contextualise the narrative elements of Sea of Tranquility, shedding light on the novel's engagement with temporal dimensions and its thematic concerns. Ultimately, the study sheds light on the quest for understanding time and its profound implications for both characters and broader societal reflections within the novel.

Keywords: Time travel; Logical possibility; Metaphysical possibility; Physical possibility; Closed world lines; Space-time theories

INTRODUCTION

Science fiction is regarded as one of the most creative genres in literature. As a form of speculative fiction, it incorporates imaginative elements that do not exist in the real world, enabling the exploration of concepts such as time travel and space travel. The genre includes a wide range of subgenres, including fantasy, the

supernatural, utopian and dystopian fiction, space opera, space western, cyberpunk, and steampunk. Its roots can be traced back to the 2nd-century Syrian satirist Lucian, whose work *A True Story* explored alternate universes and extraterrestrial life forms.

The social transformations brought about by the Industrial Revolution in the West further inspired writers to speculate on the future impact of technology. One of the most notable early precursors was the 17th-century writer Cyrano de Bergerac, who described a voyage to—and subsequent expulsion from—the moon. The term “science fiction” was later popularised in the 1920s by American publisher Hugo Gernsback, whose magazine *Amazing Stories* focused on what he called “scientification.”

By the early 20th century, science fiction began to evolve around specific thematic concerns, including space travel, robots, alien beings, and time travel. The genre has continued to expand, encompassing prophetic warnings, utopian aspirations, intricate visions of imaginary worlds, depictions of catastrophic events, strange voyages, and political commentary on techno-social change—ranging from cynical despair to cosmic optimism. Science fiction, often abbreviated as SF or sci-fi, focuses on the actual and imagined impact of science on society and individuals. In contemporary science fiction studies, the negotiation of body technologies and time travel is a recurring theme. As Javaid and Murtaza (2025) illustrate in their analysis of Wang’s *The People’s Republic of Desire*, xenofeminist futures intersect sharply with the commodified aesthetics of the time and beauty myth. In the 1920s, the term “science fiction” was popularised by one of the genre’s principal advocates, Hugo Gernsback, an American publisher. Since 1953, the Hugo Awards have been given annually and named after him. Being a modern genre, the themes revolve around scientific and technological plausibility. Some scholars argue that science fiction has its roots in ancient times, drawing a blurred line between myth and fact. Satirist Lucian, who wrote *A True Story* in the 2nd century CE, explores themes and characteristics that are often found in modern science fiction, including time travel, interplanetary travel, and artificial intelligence. Mary Shelley’s *Frankenstein* (1818) helped shape the form of the science fiction novel. “The Unparalleled Adventure of One Hans Pfall” (1835) by Edgar Allan Poe, featuring a trip to the moon, is best known for its portrayal of space travel. H. G. Wells is considered one of the most important authors; his notable science fiction works include *The Time Machine* (1895), *The Island of Doctor Moreau* (1896), *The Invisible Man* (1895), and *The War of the Worlds* (1898). His science fiction explored themes such as alien invasion, biological engineering, invisibility, and time travel. As a non-fiction futurologist, he predicted the advent of aeroplanes, nuclear weapons, space travel and the World Wide Web.

Evnine (2015) stresses that science fiction is defined as a genre. First, we need to use the term genre explicitly. Regarding science fiction, the genre is not the best term for what it has been theorising about, things relevant to science fiction. The structuralists’ approach to genre represents both cognitive and non-cognitive perspectives, as well as naturalistic and estranged ones. Science fiction is categorised in the upper suitable cell, the intersection of mental and estranged. It comprises various components, including readers, writers, works, reading practices, interpretation, publishing houses, fan organisations, and conferences. Suvin’s statement emphasises science fiction as something that cannot be found in our current circumstances, such as life on another planet, interacting with alien beings, and time travel. Science fiction can be distinguished from fantasy and supernatural phenomena naturally based on cognition. Science fiction writers often seek out new scientific and technical developments to make techno-social changes that will help expand the reader’s consciousness. H.G. Wells is considered the founder of science fiction and one of the greatest writers in the genre. He advocated for Huxley’s concerns about Darwin’s theory of evolution and provided ample evidence of science fiction’s latent radicalism, highlighting its potential for aggressive satire and ideological political agendas.

Emily St. John Mandel is a Canadian novelist and essayist who has written six novels, including *Station Eleven* (2014), *The Glass Hotel* (2020), and *Sea of Tranquillity* (2022).’ *Station Eleven* (2014) was translated into thirty-three languages and adapted into a limited series on HBO Max. The twenty-language

translated literary work, *The Glass Hotel*, is considered one of the best works of 2020 and was selected by Barack Obama. *Sea of Tranquillity*, one of the science fiction works, was published in April 2022 and debuted at number three on The New York Times Best Seller list for 'Combined Print and E-book Fiction' and number 2 for 'Hardcover Fiction'. Mandel's sixth novel, *Sea of Tranquility* (2022), is a work of speculative fiction that explores questions about time travel and the simulation hypothesis.

From one of the finest novels and most satisfying forays into speculative fiction, *Sea of Tranquility* (2022) by Emily St. John Mandel is a poignant, ingeniously constructed, and deeply absorbing novel that summons three fully realised worlds in three distinct periods. It explores profound questions about the cruel inevitability of time passing, loss, and the nature of reality that ultimately matters. The catastrophic story of Olive reflects one of the most profound passages of the novel, in which she wakes up in one world and finds herself in another at night. The book employs auto-fiction, out-and-out science fiction conceits, space travel, and sinister scientific institutions, primarily focusing on human dramas. The omniscient narration and the relaxed style seamlessly intertwine the history of the lunar colony with the most intimate moments of human life. The story conveys a vertiginous sense of reality that transcends a single existence, feeling simultaneously poignant, celebratory, and uncanny.

Speculative fiction encompasses sci-fi and fantasy, as well as mimetic fiction, which involves storytelling set in our world and true to life, without bending reality or the laws of physics, as described by Marek Oziewicz. It is a key to speculation, allowing the author to examine the themes of love, loss, family, and morality. According to Brown, the origin of speculative fiction dates back to the mid-20th century, when the genre of 'pulp fiction' gained popularity. Robert Heinlein used the term 'speculative fiction' to separate his literary work from futuristic gadget stories in science fiction, which Margaret Atwood succeeded in with her dystopian novels. However, Ursula K. Le Guin and Dorris Lessing relate speculative fiction to the science fiction narratives that can be seen in the works of Jules Verne's classical adventures, Ray Bradbury's dystopian fiction, and the post-apocalyptic literature of Emily St. John Mandel. Nowadays, a diverse array of non-mimetic genres, including science fiction, fantasy, magical realism, dystopian fiction, and Gothic literature, has emerged. Time travel refers to the hypothetical activity of travelling into the past and future. It is a widely recognised concept in philosophy and science fiction, achieved by a hypothetical device known as a time machine. The idea of a time machine originates from H.G. Wells' novel *The Time Machine* (1895). It is uncertain if time travel to the past is physically possible and can be questioned in terms of causality. With current technology, it is not feasible to make one body advance or delay more than a few milliseconds compared to another body. It is possible to find solutions in general relativity that allow it by a rotating popularised black hole. Early science fiction stories feature characters who sleep for years and awaken with different memories, allowing them to travel back to the past through supernatural means. Time travel themes in science fiction can be categorized as immutable timelines, mutable timelines and alternate histories.

David Lewis defines time travel as an object. Time travels if and only if the difference between its departure and arrival times, as measured in the surrounding world, does not equal the duration of the journey undertaken by the object. Before the 20th century, scientists and philosophers rarely investigated time travel; however, it has since become a fascinating and deeply studied topic. Holtorf (2010) explains that there have been investigations into travel to the future and travel back to the past, but travel back in time has garnered more attention. It aims to investigate the logical and physical possibility of time travel, as well as the technological practicality of such a concept. Philosophy offers three possible answers to the metaphysical question of time. According to eternalism, time is the fourth dimension, constitutive of reality and space. Possibilism deals with the eternalist depiction of the universe as correct except for the future. Past and present are fixed and actual, but the future is only possible. Presentism illustrates that only temporally present objects are natural. The past was, but it no longer exists; the future will be, but it does not yet exist.

Time travel can be defined as an experience and social practice in the present that evokes a past or future reality. It is a significant phenomenon in the expertise or dream society and a fast-developing experience industry that benefits from new technologies, such as virtual reality. Examples of famous time travel in contemporary society and popular culture include living history, first-person interpretation, fiction, movies, historical TV documentaries, soap operas, reality shows, and computer games with historical themes. It is part of mainstream culture that is in high demand and has mobility, paired with more available time and sophisticated electronic media of communication that have become widely available. Time travel is a collective term for a wide range of phenomena that are present in the present. It focuses on experience and social practice in the present that evokes past or future reality and then understands this reality as a sum of human experiences. Time travel has relevance as a characteristic contemporary way of approaching the past, and time travel experiences have become a phenomenon in our present society that requires study from different perspectives across several academic disciplines, including the humanities and social sciences. The presence of pastness and futurehood in people's lives, which flavours their experiences and shapes social practices, is facilitated by time travel.

Ryan (2006) introduces the concept of possible worlds in physics, drawing on the notion of parallel universes, as explored in literary and narratological aspects by Umberto Eco, Ruth Ronen, and Thomas Pavel. The alethic system is based on operators expressing possibility and necessity, and another modal system emerges in this way: propositional attitudes, including beliefs, desires, and obligations. There is another approach to what exists in imagination rather than the natural world that is more compatible with the plurality of distant worlds in the Possible World theory. It is as if the universe is structured or organised so that the centre is the actual world, with the possibility of surrounding worlds that do not exist in reality. The concept of accessibility relations provides insight into possible and impossible worlds. The existence of the actual world is autonomous compared to the possible worlds, which are the products of cognitive activities of dreaming, imagination, and catastrophe.

Through modal realism, Lewis discusses the indexical notion of actuality, in which the existence of the actual world can be non-actual for the species of possible worlds. In phenomenology, the semantics of fiction are created by our minds to define the fictional aspect of non-actual possible worlds that surround the complete modal system of the actual world. The pseudo-factuality of parallel world theory involves the imaginative re-centring of readers, spectators, and players within the fictional world or the actual world of a fictional system of reality. To transcend the boundary between fiction and non-fiction in the cognitive model of narrativity in which stories have been mentally constructed in response to specific texts, discourses, artworks and life. At the same time, there is an inscription to the semiotic realisation of these stories as text, images and sounds in narratives. This cognitive approach in narratology denies the traditional idea of stories as the sequence of events in virtual reality.

Time travel has long fascinated humanity and has a unique place in literature and storytelling. Time travel stories have long been perceived as unrealistic and fantastical notions, confined to the realm of fanciful tales. However, writers of recent times have delved into new writing styles and techniques. They discovered time travel as a powerful tool for narrative storytelling and rhetorical persuasion. Here are the aims and objectives of time travel in science fiction that have been described. The incorporation of time travels into narratives emphasises its role in helping readers understand characters' perspectives and conveying overarching messages for society. It conjures images of machines and adventurous journeys through time and space. Time travel is a cognitive tool for authors as they organise their thoughts and construct coherent narratives. These authors mentally traverse time to connect past events, future predictions, character thoughts, and actions within a single, cohesive story. By employing temporal elements, authors can present fragmented moments in time as a unified and interconnected narrative, captivating the readers' attention and imagination. The projection of time travel into narratives is not limited to abstract concepts; it finds concrete expression in works of literature. It demonstrates how time travel can bridge the gap between two vastly different periods, highlighting the tensions, conflicts, and complexities that arise when characters

from diverse backgrounds and historical contexts interact. Travel narratives shed light on historical injustices, social issues, and the enduring legacy of the past.

There is a philosophical discussion of the phenomenon, which has been summarised in empirical literature under the concept of ‘mental time travel’. So, there is an outlook on differences and similarities between two cases of ‘mental time travel’, re-collective memories of past events on one end and sensory imagination of future events on the other hand. Dorothea's (2014) insight into the concept of ‘mental time travel’ stands at the centre of an influential body of new work that emerged in neurosciences and contemporary literature. It is essential to recognise that time travel is inherently present in most narratives, whether consciously intended or not, in the form of transitions, flashbacks, and shifts. These elements help authors craft more concise narratives by skipping unnecessary details. In this way, readers remain focused on the central idea and thematic concerns without being overwhelmed by superfluous information.

The central idea of ‘mental time travel’ is that human beings can be aware of and direct their attention towards the past and future, as in memory and foresight, respectively. It is projected towards events, affairs, and objects that are not present at the time of the relevant mental occurrence but instead lie in the past and future. Neuroscientists have found that both mental time travel into the past and into the present are possible, whereas we cannot travel back in time to the past or into the future. Contemporary literature explores the question of whether non-human objects can engage in mental time travel, or if it is a uniquely human activity. The recollective memory of the past and stimulated imagination of the future are considered vivid forms of mental time travel. Empirical research suggests that the objectivity of the past and the future is a mental phenomenon of two distinct types. Time travel narratives are the vehicles for addressing societal issues and offering critical commentary. The narrative tools provide authors with platforms to offer social commentary. These narratives serve as a medium through which authors engage with and reflect on the world around them, leaving a lasting impact on society.

Sea of Tranquillity, a science fiction work by Emily St. John Mandel, was written during the COVID-19 pandemic and published in April 2022. The novel explores time travel, the nature of reality, art, love, and the impact of pandemics. It is longlisted for the Andrew Carnegie Medals for Excellence in Fiction. *Sea of Tranquillity* (2022) follows a time traveller, Gaspary Jacques Roberts and the people he encounters in the 1910s, 1990s-2020s, 2200s and the 2400s. The novel begins with the story of Edwin, who travels around Canada, where he witnesses an anomaly which momentarily transports him from the forest in Caiette to the Oklahoma City Airship Terminal. The next part of the novel focuses on Mirella, who, in 2020, is searching for Vincent Smith and obtained footage of an anomaly in Caiette as a teenager. The catastrophic journey of Olive from one world to another clearly depicts the supernatural involvement. The concept of time travel is evident throughout the novel.

Herbert George Wells, an English writer of prolific non-fiction output, includes works of social commentary, politics, history, popular science, satire, biography, and autobiography. However, his science fiction novels are so well-regarded that he has been called the ‘father of science fiction’. He was a prominent prophetic social critic and wrote utopian works to foresee the advent of space travel, nuclear weapons, and satellite television. His science fiction imagined time travel, alien invasion, and biological engineering before these subjects became common in the genre. The traces of Wells’ futurism can be seen in Mandel’s speculative fiction. H.G. Wells was an English writer who was prolific in many genres, including politics, history, satire, and science fiction. Wells is regarded as a pioneer of science fiction and conjured some futuristic visions that have yet to come true, such as a machine that can travel back in time and a man who turns invisible. As a futurist, he wrote several utopian works. He has the imagination to get to the future sooner than it was going to happen. Wells rejected the idea that the future is unknowable through ‘inductive history’ and ‘Human Ecology’.

Cantor and Hufnagel (2006) address the fact that Wells’ scientific romances of the 1890s are remarkably innovative in form and subject matter. His notable work, *The Time Machine*, inaugurated the genre of

science fiction that his contemporaries have even intimated. The modernist view of the novel aligns with the Victorian theme of the Empire. He imagined a journey into the future but ended up at the imperial frontier. Wells articulates the theory of four dimensions, particularly the equivalence of time and space. His theory of time travel rests on the idea that it's the only form of space travel. He had an experiential basis for time travel provided by imperialist romances. Wells not only orientalized the future but also orientalized the future of Britain. It is the portrayal that Britain succumbed to seductive forces it hoped to subdue on the imperial frontier. Imperialist anxiety informs Wells' vision of Britain's future. He developed the critique to show and takes the time traveller to understand the world of the future.

In *Sea of Tranquility* (2022), Mandel illustrates the possibility of time travel in the coming modern days in light of Wells' theory of time travel. The novel presents Wells' time travel perspectives through the journeys of the male human characters, who travel either backwards in time or forward into the future. In this way, the study sheds light on Wells' concept of time travel as a potential future possibility.

LITERATURE REVIEW

Time Travel has been a fascinating genre in science fiction that filmmakers and directors have explored through the lens of cinema. This thesis examines the significant role of cinema in exploring concepts of time travel. Zaglewski (2019) is concerned about the cinematic meta-genre that includes superhero movies, which gained recognition in 2017. The success of the film 'Logan' (2017) has received critical appraisal for superhero films in the technical category. Following this, the animated film 'Spider-Man: Into the Spider-Verse' marked its place as a Best Picture nominee, and the popularity of superhero films paved the way for a long-term future, made possible by the release of 'Joker' (2019), which won the main prize at the Venice Film Festival. These comic genre-based films and book projects the quantum narrative through the entire superhero universe. From 'Iron Man' (2008) to 'Avengers: Endgame' (2019), these superhero-themed films dominated the cinema. These super-heroic actions of the comic genre bring the super-heroic stories of never-ending plots that twist the narrative patterns within the exact characterisation. In this way, the most unpredictable form of entertainment is presented. Douglas Wolk commented that the thirty-two-page pamphlet explores the vast narratives of Marvel comics, which readers of superhero comics can interpret. The quantum narrative has been hindered by the narrative inefficiency of coherence between the times, especially in the present day, in the plot. The most alluring feature in these fictional stories is that the resolutions and convergences do not lead towards the main solution of the conflict. This becomes the most attractive feature of the the Marvel Cinematic Universe, which is unfit for the classical narrative model of cinema, according to Philips.

The idea of continuity presented by Backman reflected the comics and non-comics genres within the Marvel Cinematic Universe. He further explained the art of storytelling for counterfactual narratives in the multiple universal fiction, which was denied by Ryan's modal logic. However, both approaches, with different timelines, have validity in providing a contradictory vision of well-known stories. The traditional linear narrative is challenged by the multiverse concept, making superhero stories infinite rather than timely, which, leads to the quantum narrative. That's why the Marvel superhero stories become part of quantum events, creating an alternative timeline within time and space. In 'Avengers: Endgame' (2019), a quantum narrative approach has been adopted in a multiverse-related narrative. The concept of time travels in the 'Avengers: Endgame leads towards the catastrophic events of 'Avengers: Infinity Wars'. By going back in time to collect the Infinity Stones, the erasure of the apocalyptic moment was the primary concern for the survival of human beings in the film.

The 'infinite multiverse' narrative was introduced in the film 'Avengers: Endgame' (2019), as explained by a character, who stated that travelling in the past would create a future, and the former present would become the past. The concept of parallel timelines is traced through the Infinity Stone, which served as a weapon against all evil to ensure the survival of human beings. The new branches of time have been

explored in the multiverse narrative universe within the Marvel Cinematic Universe, with possible narrative paths. The concept of quantum seriality has made superhero stories more diverse in various ways, including the loose connections through catastrophic events within the multiverse, the authorial approach in superhero narratives that avoids developing long-term stories, and the portrayal of cinematic imprints to serve alternative timelines. Quentin Tarantino's Luke Cage had not developed a 'shared timeline' in the Marvel Cinematic Universe, but it has an authorial approach. Luke Cage was added to the comic book franchise without any attachments to the sequels and crossovers. It is a rescue plan in the multiverse quantum narrative for the pursuit of the Marvel Cinematic Universe.

The individualistic, chaotic, and turbulent journey of the Joker can be seen as an odyssey representing the swirling and unpredictable nature of his actions within the Vortex. Another extension of the self-dependent approach was followed after the Marvel-based strategy to create coherence within the resolution, and in an efficient way. This authorial approach is evident in Todd Phillips' 'Joker'. The individualistic production of the strong and iconic villain in the history of comics disconnected it from the central cinematic universe. However, it has a radical representation in Comic book films, Joker's insight into the individual variation of a story and character without any universal restrictions. The cinematic imprint was developed by DC in 1989, marking a departure from canonical approaches. This projects the liberty of more concrete and sacred interpretations of comic book heroes for vitality in narratives. The alternative storylines in quantum timelines were developed through this independent imprint-based narrative, which led to the success of Joker.

The element of Time Machine Odyssey, in terms of scientific adventure, is implemented, which is related to the production of film; the hyper-reality aspect of technology emerges to provide a better experience and sensation for viewers. The movie Avengers: Endgame, directed by Antony and Joe Russo, has the hyper-reality effect. Budianto, Setiawan, Retnaningdyah, Barus, Ningsih, and Amelia (2020) focus on the aspect of time travel that can be identified through the use of technology in the movie. The superhero in the film is Iron Man, who wears an iron suit and flies to stop a meteor headed for Earth. His lifestyle is fantastic. Everything he uses in his home is automated, involving the use of technology—the weapons he uses to fight against the villains from different planets and galaxies on Earth. Even in the end, he retrieved all the Infinity Stones in magic gloves to maintain peace on Earth and ensure the survival of humankind. Here, we see a science-fictional world where characters use technological equipment to travel anywhere and fight against all the evil in the form of monsters. Wells' idea of technology, as mentioned in 'The Time Machine' (1895), has now become a staple of films, particularly those in the scientific genre.

DISCUSSION AND ANALYSIS

This chapter explores the scientific approach in English society. It describes the technological advancements that have been modified to address concerns about human existence and chaos in modern life. These dynamics would be discussed under Wells' concept of time. This chapter mainly deals with the temporal mechanics in Mandel's *Sea of Tranquillity* (2022).

Time's Tapestry: Convergence of Timelines

The *Sea of Tranquillity* takes readers from Vancouver Island in 1912 to a dark lunar colony 500 years into the future, in the year 2401, weaving a narrative that stretches across centuries and space. The story revolves around art, love, and plague, with a strange temporal phenomenon connecting a handful of characters throughout different moments in history. The plot is unified through the role of the protagonist, Gasperry-Jacques Roberts, who discovers a time anomaly and contemplates its far-reaching implications for humanity. The novel's thematic concerns include time travel, space travel, moon colonisation, and simulated reality. It suggests that humans exist within a complex web of interconnected experiences, and that understanding this interconnectedness may offer a way out of their collective crises. This research highlights the novel's portrayal of the future of space exploration and planetary colonisation over the next

few centuries, particularly through the creation of the dystopian lunar settlement known as Night City. One of the most compelling aspects of the narrative is the interplay between time travel and simulated reality. The story begins with the narration of Edwin St. John St. Andrew, a young man living in England in 1912. After being disinherited from his aristocratic family due to his radical political beliefs, Edwin moves to Canada, where he finds solace in solitude and wilderness—things he feels Britain lacks. His worldview becomes evident during a family dinner when he remarks, “Sometimes you don’t know you’re going to throw a grenade until you’ve already pulled the pin” (Mandel, 2022, p. 20).

He wants a special kind of escape from the wilderness of life, and he can make this by going out of this wild region. This kind of wilderness or void can be seen through speculative fiction. Speculative fiction focuses on possible futures, human problems rather than technological ones, and offers insight into post-apocalyptic aspects, dystopia, and weird fiction. The concept of simulated reality is explored in speculative fiction. Consciousness is believed to be a complex process that emerges in the brain. The chemistry in the brain that has evolved our inner world of thought, emotion, and personal identity is the direct result of the experience of consciousness that we all possess. This concept extends to something similar, and what actually constitutes virtual reality, based on the ability to act like a vast mental processor, much like physical reality. Every detail of the entire universe that is governed by the laws and logic of intelligence makes way for the unbounded intelligence of unlimited concentration of dreaming. The super abilities of consciousness, through data storage, computation, and processing within the unbounded and infinite potential, create the simulation of the universe. The creative consciousness facilitates the evolution of entering into real-life forms and experiencing things that do not actually exist, such as the life of human beings on Earth or on another planet. “There is always something that is computed into consciousness to find out the real purpose of life, to reach a certain thing “I am certain there was not a single thought in my head. It was a kind of void” (Mandel, 2022, p. 22).

His simulated reality is evident in his actions, such as when he plays chess. It was more than a game for him. “Oh, just contemplating my next move, I suppose. He always replies, or words to that effect. He has a sense of waiting for something. But what?” (Mandel, 2022, p. 28). For this projection of consciousness into the virtual universe, Haisch (2014) provides an example: the reflection of light off a glass surface. For instance, during the daytime, if the room's lights are off. We have to look out the window into the garden. What we would observe is the garden, and the same thing would happen at night. If the light in the room is on, we will not be able to see the garden, but rather our own reflection in the window. This concept of partial reflection can be illustrated through an experiment conducted by Richard Feynman. During an experiment in a laboratory equipped with a laser, a stream of light is directed into an upper position, and as it is lowered, individual photons of light emerge that can only be detected by an electronic detector. Out of the hundreds of photons, only four photons will reflect. The phenomenon is performed in such a way that the first photon never conveys information to the subsequent photon, and they both hit the same spot on the glass, but have different impacts.

According to the quantum electrodynamics of Haisch (2014), this phenomenon of reflecting photons is demonstrated by the Two-Slit experiment, which involves using a laser and a screen with two narrow slits. The laser beam spreads out when covering both slits, rather than a single slit. When light passes from the laser through an open slit, a pattern appears on the wall behind the slit due to the spreading of light. This process is called single-slit diffraction. By opening the second slit, light from each slit will undergo diffraction and light from both slit will interfere with each other to have a double-slit interference pattern. The laser beam is turned so low that an individual photon can go through the single slit. Through both experiments, it is evident that actions are performed in accordance with physical laws.

Edwin had a strange appeal to take a tour of the forest. He becomes deranged in this place and no longer worries about his life and its circumstances; instead, he embraces his individuality and self-being in this calm and tranquil setting. In the forest of Caiette, he saw a young man in his thirties. His accent was different

from British and had no resemblance to anywhere else. The man was strange and introduced himself as Roberts, a priest in a nearby Church. The man goes into the church, and Edwin finds himself,

“into a flash of darkness, like sudden blindness or an eclipse. He has an impression of being in some vast interior, something like a train station or a cathedral, and there are notes of violin music, there are other people around him, and then an incomprehensible sound” (Mandel, 2022, p. 33).

After this, Edwin lost his sanity and vomited to regain his senses. He followed the priest into the church and told him about the strange things he had seen in the forest, but the details had faded from his mind. “It seems silly now, and a little unreal. I thought I saw something in the forest. After I saw you, I heard something I don’t know. It seemed... supernatural” (Mandel, 2022, p. 35). Edwin asked Roberts about Father Pike, but was astonished by the news that he had left the night before, as there was no chance to go, since no boat had left shore that night. “There’s wrongness about the man that Edwin can’t entirely pinpoint” (Mandel, 2022, p. 36).

Details about Roberts’ identity remain uncertain. The priest deflects about his stay in Caiette, and during this conversation, Father Pike come towards Edwin. The chapter ends when Roberts fled the Church through the back door.

Haisch (2014) rejects the views that physical laws influence consciousness, instead advocating the idealistic views of Dr Samuel Johnson, an eighteenth-century literary figure in the English Language after Shakespeare. Two major astrophysicists have emerged in the 20th century: Sir James Jeans and Sir Arthur Eddington. Eddington proposed the idea of a spiritual world in which consciousness not wholly or primarily received the sense impression in his *Science and the Unseen* (1929). The non-mechanical reality and the existence of a universal mind are discussed in *The Mysterious Universe* (1932) by Jeans. For him, there is a non-physical mind beyond space and time, a kind of unbounded consciousness to think, contemplate, imagine, reason, and for calculation and computation. There is the storage of bytes of consciousness to process software thoughts, which are subjected to the laws of nature, and to model the hardware consciousness. A simulated reality is created beyond imagination for the entire universe. Human beings are the real projections of this consciousness in the virtual world.

“The universe begins to look more like a great thought than like a great machine. Mind no longer appears as an accidental intruder into the realm of matter. We are beginning to suspect that we ought rather to hail it as the creator and governor of the realm of matter....” (Haisch, 2014).

Universal consciousness is the actual reality in which living a life in an imagined space and time allows for an adventurous experience that fosters the growth of fundamental consciousness. The lessons that have been learnt are real, even if they do not exist in real life. The origin of space, time and other universes within different laws has the same concept. The temporal-spatial dimensions are specified by rules that govern a universe in the software and are consistent with each other within the given universe. Virtual reality is created through online versions, known as avatars. This second life focuses on attributes that allow individuals to interact with each other, either individually or in the form of peer groups, to create an artificial reality that becomes more realistic.

Edwin’s simulated reality, which had a conscious awareness of those events that were not real in the virtual world, overlapped with a different timeline. There is an instant jump from 1912 to 2020 in which certain events and characters relate to each other. The other timeline starts with the story of Mirella Kessler in 2020, who is investigating the truth behind her friend Vincent’s death, who is presumed dead. Here, Mandel again explores the idea of cross-pollination in her stories, as seen in her novel ‘The Glass Hotel’, where Vincent disappears, and this theme is further developed in ‘Sea of Tranquillity’ (2022). She is attending a concert when the composer introduces the audience to a video of his sister, Vincent.

“My sister used to record the videos. This next one is a video of hers that I found in storage after her death, and it has some glitch in it that I can’t explain. I wrote some music to go with it, but right before the glitch, the music will go silent” (Mandel, 2022, p. 40).

Vincent walked into the forest towards an old maple tree. Then, the screen went black as the composer’s music stopped, and strange sounds were produced. A different and oblique angle of Vincent came in front of the lens. Vincent found the anomaly in the film while walking through the same stretch of forest in British Columbia that Edwin had visited. This incident of overlapping timelines in both chapters can be analysed according to the claim of Ng, Chen, Kan, and Li (2014) through temporal information in the form of timelines; in this way, the automatic temporal processing system will be helpful to generate a timeline. A summary can create an input collection of documents with minimal repetition of similar points through multi-document summarisation. The temporal information obtained through the input text is summarised with improved quality. The temporal information can be helpful in summarisation through the recognition of the sentence that is about to storm and has happened in the past, when writing a summary of a recent storm that may be non-relevant and can be excluded. To address the critical gap in the exploitation of temporal information, there is a need to construct a timeline and incorporate it into the art multi-documentation system.

The story further evolved with the appearance of characters that overlapped in different timelines. To further investigate this case, Mirella undertakes a search for more about Vincent with the help of social media. She used her husband’s surname, ‘Vincent Alkaitis’, but she didn’t find her photos. The recent images she obtained are of ‘Vincent Smith’, but not the one she was looking for. She then typed ‘Paul Smith + composer’ on Google with the hope that only he could tell her about Vincent. She went to Paul to meet him, and at the same time, another man came, Gaspary Roberts. Mirella introduced herself as Vincent’s friend. Gaspary is the same person whom Edwin met in the woods. Gaspary is the main character of the novel who travels through different timelines. Mirella turned her attention to Vincent’s name by Gaspary during his conversation with Paul. “So your sister, Vincent, she’s the one who filmed that strange video in your performance tonight? I meant that video with the forest path, With the darkness, the strange sounds” (Mandel, 2022, P. 47). Paul revealed it in Gaspary’s question that Vincent grew up there, and the video was filmed there. Gaspary further explained it “That...that moment on the video, that anomaly for lack of a better word” (Mandel, 2022, p. 48).

In the above discussion of characters, an anomaly of time can be emphasised by referring to the concept of a multidimensional aspect in the vast and countless universes, i.e., the multiverse. Saptanto, Dewi, Nurjanah, Putri, and Safinah (2023) describe this multiverse as being believed to exist in real life and as one of the pressing issues of modern society. The concept of teleportation, which involves jumping from the present reality to the past or future and moving across dimensions, is explored in contemporary fiction. The concept of the human journey after death is understandable in the context of the science fiction genre, which explores the transfer of dimensions, time, and the universe. The transition from one world to another is still considered taboo, but it is an integral part of the storytelling process. There is a resemblance to the principle of human belief that is related to death. The stories based on human experiences of near-death are all alike in that they feature a hall-like wormhole that creates a linkage between the realms of life and death. There is a mystery in this transition from life to death. The transition from one timeline to another, such as moving from life to death, is a source of inspiration in inter-dimensional travel in modern storytelling. “Idea of transfer of dimensions, time and universe....bears a resemblance to our understanding of the concept of human journey after death” (Saptanto, Dewi, Nurjanah, Putri and Safinah, 2023).

Mirella is further interested in knowing about Vincent and got to know about her drowning after being abandoned by her husband. She went to the park to relax and to escape her grief over Vincent when Gaspary came and told her that he was an investigator. Still, Mirella found “something familiar about him...something about his profile that rang a distant bell, but she couldn’t quite place him” (Mandel, 2022,

p. 51). Gaspary tells him that he is interested in Vincent's case like Mirella; "But I am interested in, well, in a certain kind of anomaly, like that moment in the video when the screen goes black" (Mandel, 2022, p. 51).

Through the character of Gaspary, the focus of the dimensional travel is highlighted. The dimensional travel in modern storytelling techniques is highlighted through the use of non-linear narrative styles or non-sequential plots. It creates numerous problems for character development in the diverse modern narrative. Due to the non-linear and multi-linear structure created by the eclectic theories of the universe, the main character traverses different dimensions. It is reborn in a world in the middle of nowhere, making the narrative more perplexing through inter-dimensional travel. Things became more uncertain and overlapped when he said that she would be young at that time when she shot the video; "The things we see when we're young, sometimes they don't stay with us" (Mandel, 2022, p. 51).

At that point, Mirella found it more strange about Gaspary and remembered a past event and said to Gaspary, "No, I think it was you. You were under the overpass. Right before the police came, before you were arrested. You said my name" (Mandel, 2022, p. 52). She remembers that Gaspary could not be the same man she saw in her childhood because he had not aged yet. A fortune teller came to Mirella when she was hanging out with Lousia. Here, Mirella contemplates her life, "How could the man in the tunnel in Ohio have surfaced all these years later in New York? How could Vincent be dead?" (Mandel, 2022, p. 58). And then the fortune teller asked for her secret, to which she responded that she wanted to kill a man.

All the scenarios that occur in the chapter make the work of art more challenging. Diverse opinions and theories emerge through the resulting meanings of the story. Different kinds of symbols and icons are used to create a unified appearance of the story, as seen in this novel. For instance, the video clip, the character of Gaspary, or stories set in different eras or timelines connect one world to another or one dimension to another, facilitating inter-dimensional transitions. This transition of a person from one dimension to another is approached through the transition from one universe to another, according to Saptanto, Dewi, Nurjanah, Putri, and Safinah (2023).

Russian Formalist Vladimir Propp suggested the terms 'Fabula' and 'Sjuzhet' to examine storytelling techniques. Fabula refers to the chronology of events, including all scenes, characters, and events in a story, which share a causal relationship that explains how things happened in the narrative. Sjuzhet, on the other hand, refers to the events in an order that is not linear or simple. The multiverse approach enhances the author's creativity and imagination, as it allows them to explore the infinite possibilities and variations within the fictional world. The admiration and curiosity of simultaneous life from various dimensions consist of adventures to explore the vast universe.

The article "*Simone and the Books*" (2022) reveals the twists, turns, and surprises, shedding light on the novel with vivid descriptions. The inspiring story delves into the emotions one navigates with great detail. The story connects people from different timelines, including those of the 20th, 21st, and 22nd centuries, who hear a violin playing and an airship taking off in a mysterious forest. Mandel's description of designing a moment for her reader is to make it seem possible that one could be snapped in a random space in time at any moment, and to change completely through an experience. There is a projection of Blake Crouch's science fiction thriller that will provide the factors to take the narrative into a paradoxical Quantum Leap-like direction. In the end, Mandel pens a satisfying and enduring hope for the future and the world around us. Within the thematic concerns of humanity and the unpredictable laws of nature, we lead towards paths and ways of destruction and reincarnation in scenarios that suddenly take a turn with the different choices we make. The shifting of timelines, as in the case of Gaspary, to solve anomalies through travelling into the past, focused on Mandel's vision by twisting it into a Crouch sci-fi thriller.

To further explain the overlapping of events in different timelines, we need insight into the number of elements and each element's onset and offset times within the event, which are comprised of naturalistic

events that are temporally and structurally complex. As Carell (2011) noted, the complex patterns of partially overlapping stimulus events are used to examine temporal information processing. Five actors appeared on the scene for different periods of time, observed by the participants on pantomime, in which the temporal pattern of pantomime is reconstructed by drawing a timeline for each actor within the estimated duration of the actor's presence. Accurate responses were provided by the participants, who used the timeline as a retrieval aid. Many tasks have been completed with partial overlap, differing in onset and offset times, but without any sequential timelines. They need to be rescheduled, monitored, and updated. Some other tasks require temporal complexity, but the level of temporal complexity is low in the case of past timing research. The judgment made by the participant depends on the occurrence of a discrete event.

This can be seen through Carell (2011) approach by Taking an example of actor to be appeared in different scenes in which first scene is followed by actor A and B. Second scene is followed by actor C and D and third scene by Actor E and the reappearance of actor A and D. So, the multiple elements with different onset and offset events reflect the total duration and actions of individual components to constitute a temporal pattern of event formation. In the case of real-world events, as with the attentional-gating model, there is a difficulty in obtaining the results of multiple elements within different onset and offset events. If a witness observes an event in which persons or activities appear for various periods of time, the witness will observe specific temporal and non-temporal attributes. However, in an incorrect duration estimation, there is a possibility that the witness's actual competence relies on spatial recording and reconstructing a timeline as a form of retrieval guide.

Giordano (2014) explained that the overlapping timelines shift into a different kind of experience, known as *Déjà vu*. This can be experienced in the sense that past events continue to have an impact on the present. Tony Scott, as a director, is more sensitive to social shifts and artistic and cultural modifications, and the content and structure of his films seem to be modern in relation to the movements of post-modernism, meta-modernism, and pseudo-modernism. In his movies, such as '*Déjà vu*' (2006), there is a reflection of the functions of social media and new ways of visual technology that are more metalinguistic and meta-modern in nature, indicating total visibility and a space of complete control for humanity. As shown in the movie '*Déjà vu*' (2006), there is a comprehensive understanding of technology and its influence on media apparatus and social life within the context of contemporaneity. The emblematic film has formal and thematic concerns that make it more postmodern. A non-linear time can be observed in *Déjà vu*. The time is analysed by Einstein's concept and classified within the range of science fiction.

Section three, 'Last Book Tour on Earth/2203' of the book relates to the *déjà vu* experience through the character of Olive Lyewellyn, an author of speculative fiction in 2203 who visited Earth for a book tour. She had the desire to live on Earth, as she had been a resident of the moon colony. "Did Olive actually wish she could live on earth? She vacillated on the question. She'd lived all her life in the hundred and fifty square kilometres of the second moon colony, the imaginatively named Colony Two" (Mandel, 2022, p. 63).

She was busy with book signings, question-and-answer panels, fan meetings, and giving speeches on pandemics and viruses, visiting cities one after another. Olive talked to her husband Dion, who was an architect and had a project to build a university with secret tunnels adjoining neighbouring police headquarters, which was more unsettling for both of them to understand: "Of course. I won't tell a soul. But what's so secret about the architecture of a university? There's some weirdness in the blueprints.... There's a tunnel under the street connecting the building to Security Headquarters" (Mandel, 2022, p. 67). Moving further in the section, we can retrace the unsettling event in a dialogue between Olive and the driver, in which he asks Olive about her novel, which she is working on. Olive told him about 'Marienbad', a story that tells about a pandemic. The driver showed concerns about the possibility of a multiverse and said that: "I mean, for all we know, there's a universe where your book is real, I mean nonfictional!" (Mandel, 2022, p. 69).

This point of the multiverse is polished by Autelitano's work on temporality, as explained by Giordano (2014), which concerns the difference between the anachrony on the single timeline and the anachrony that enables the multiplication of timelines in postmodern cinema, and this multiplication of time does not lead towards the multiplication of space. A distinctive post-modern element of multilevel construction, characterised by the co-presence of several possible worlds that develop their own narrative lines, is reflected. The amalgamation of past and future is illustrated through temporal flux, where, at a single point, past reality anticipates the cause of what happens in the future in a completely different scenario. Alternative results are not expected in a homogeneous linear timeline, in which the modification of past events leads to future outcomes. The immutability of the past has both scientific and spiritual objections, rejecting the concept of a single past and a single future existing in sequence. The film explores the idea of a single world with an immutable time flow, as well as the concept of a ramified world within the context of time travel theory. In this way, the original branch can move into a parallel world to the new branch, and what happens after changes in the past take place in the expansion and pluralisation of spaces and times can lead to its disappearance.

Another incident of overlapping timelines and time travel can be seen in the discussion between Olive and the driver, where he asked her about her stay in the moon colonies. Olive responded that her grandmother was one of those settlers on the moon colony. The driver gave his statement in response to her as: "Remember that you're lucky to get to travel. Remember that some people never leave this planet" (Mandel, 2022, p. 72).

Through Olive's travels to different places and spaces, we can recognise how spatial and temporal dimensions are created. During a discussion with the library director in Cincinnati, Olive was informed by the director of the leased space. "We hold a ten-thousand-year lease on the space.... Imagine thinking civilisation would still exist in ten thousand years. But there's more.... The lease is renewable" (Mandel, 2022, p. 75).

Olive's interaction with an interviewer in Tallinn: Olive was concerned about the surreal aspect of publishing a book that slipped into a parallel world. This approach of time travelling came to her mind in an airship while crossing the Atlantic in such a way that she thought,

"Research teams had been working on time travel for decades, both on Earth and in the colonies. In that context, a university for the study of physics, with an underground passageway to the police headquarters and countless literal back doors into government, made perfect sense. What is time travel if not a security problem?" (Mandel, 2022, p. 78).

The shifting of thoughts and events fuels the shifting of timelines, which Olive even felt through the distraction of thoughts she experienced while moving over a landscape, a kind of parallel tour, and the shifting of these thoughts in uncharacteristic messages in her own books.

CONCLUSION

This study probed that time travel has long fascinated humanity and has a unique place in literature and storytelling. Time travel stories have long been perceived as unrealistic and fantastical notions confined to fanciful tales, but writers of recent times have explored new writing styles and techniques. They discovered time travel as a powerful tool for narrative storytelling and rhetorical persuasion. The incorporation of time travels into narratives emphasises its role in helping readers understand characters' perspectives and conveying overarching messages for society. It conjures images of machines and adventurous journeys through time and space. Time travel is a cognitive tool for authors as they organise their thoughts and construct coherent narratives. These authors mentally traverse time to connect past events, future predictions, character thoughts, and actions within a single, cohesive story. By employing temporal

elements, authors can present fragmented moments in time as a unified and interconnected narrative, captivating the readers' attention and imagination.

The projection of time travel into narratives is not limited to abstract concepts; it finds concrete expression in literature, as addressed by Dorothea (2014). It demonstrates how time travel can bridge the gap between two vastly different periods, highlighting the tensions, conflicts, and complexities that arise when characters from diverse backgrounds and historical contexts interact. Travel narratives shed light on historical injustices, social issues, and the enduring legacy of the past. There is a philosophical discussion of the phenomenon in which empirical literature has been subsumed under the concept of 'mental time travel'. So, there is an outlook on differences and similarities between two cases of 'mental time travel', re-collective memories of past events on one end and sensory imagination of future events on the other hand. The concept of 'mental time travel' stands at the Centre of an influential body of new work that emerged in neurosciences and contemporary literature.

It is essential to recognise that time travel is inherently present in most narratives, whether consciously intended or not, in the form of transitions, flashbacks, and shifts. These elements help authors to craft more concise narratives by skipping unnecessary details. In this way, readers remain focused on a central idea and thematic concerns without being overwhelmed by extra information. The central idea of 'mental time travel' is that human beings can be aware of and direct their attention towards the past and future as in memory and foresight, respectively. It is projected towards events, affairs, and objects that are not present at the time of the relevant mental occurrence but instead lie in the past or future. Neuroscientists have found that both mental time travel into the past and the present are underpinned, suggesting that we cannot travel back into the past or the future. Contemporary literature explores whether non-human objects can engage in mental time travel, or if it is a uniquely human activity. The re-collective memory of the past and stimulated imagination of the future are considered vivid forms of mental time travel. Empirical research suggests that the concepts of the past and the future are mental constructs of two distinct types.

This research examined how Emily St. John Mandel's *Sea of Tranquility* (2022) revealed elements such as time travel, space travel, simulated reality, and moon colonies through recurring events. The novel has both humane and non-humane aspects, making it more overwhelming in its exploration of the idea of existence and the search for one's belonging in the complex web of life, amidst personal problems and massive ongoing societal changes. The future of space exploration and planet colonisation is a semi-plausible outlook.

This research punctuated the darkness through moments of beauty and connection. Mandel offers a glimpse into the intricate web of time and memory through the characters of Vincent, Olive, and Gaspary, and perfectly addresses the symbolic significance of the mysterious expanse of human experience within the transcendent boundaries of time itself. The book allows the readers to ponder the nature of existence, time and human connections. The reality is a constructed simulation, echoed in the shifting timelines, which reveal the fragility of time through the events that have converged across different eras. To escape the limitations of earthly existence, the characters show the human desire for transcendence through lunar colonies. The ethics of colonisation and the consequences of playing God provoked thoughts of the novel when a time machine was created to shift through the temporal-spatial dimensions.

The study showcased a multifaceted reality in which human beings and technological inventions, such as time machines, have been shifting to mirror the deepest fears, desires, and hopes, thereby contemplating the infinite possibilities beyond reality. Technological advancements have been utilised in the novel to facilitate time travel, but they also played a pivotal role in highlighting the negative consequences that threaten the fabric of reality. The technological facilitation of time travel, i.e., portals, machines, and neurotechnology, explores the chaos in human existence. The negative consequences of timeline instability threaten the integrity of timelines. Temporal resonance destabilises the fabric of reality, memory overlap causes disorientation and blurred identities, and causality distortions and personal consequences highlight

the dangers of tampering with the fundamental nature of time. The book serves as a cautionary tale addressing the accountability of advanced technologies.

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