

التغير المناخي، وانقراض الأنواع، والعقم البشري في مجموعة جيمس برادلي

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Climate Change, Species Extinction, and Human Infertility in James Bradley's *Clade*

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المخلص

تتناول هذه الدراسة التهديدات البيئية في رواية جيمس برادلي "كليد" (٢٠١٥)، مع التركيز بشكل خاص على تغير المناخ وتدهور التنوع البيولوجي عبر ثلاثة أجيال من عائلة ليث. وباعتماد على منهج نوعي يستخدم النقد البيئي ونظرية الحزن ودراسات السكان الأصليين، يستكشف البحث التفاعل بين الأزمات البيئية والتجربة الإنسانية المعاشة. ويُبرز البناء السردى المتقطع الآثار الاجتماعية والنفسية والوجودية لعدم اليقين المناخي، والمتمثلة في الأزمات الصحية، والحنين إلى الماضي البيئي، والتساؤلات الأخلاقية المتعلقة بالتكاثر والبقاء. وتكشف المخاوف البيئية الرئيسية، بما في ذلك انقراض الأنواع، وانهيار مستعمرات النحل، واستخدام النباتات



المعدلة وراثيًا، عن الروابط المعقدة بين الأفعال البشرية والتدخلات التكنولوجية والنظام البيئي الهش. وتركز "كليد" على المرونة والمسؤولية بين الأجيال وإمكانية التجديد البيئي، مع انتقادها للأنظمة الرأسمالية التي تُقاوم الضرر البيئي. من خلال دمج الروايات العائلية الحميمة مع المخاوف الكوكبية، يطور برادلي الخيال البيئي كوسيلة لتعزيز الوعي البيئي وتشجيع التفكير في المسؤوليات الأخلاقية للبشرية في عصر الأنثروبوسين. أثارت رواية "كلاید" العديد من المراجعات النقدية. ومن الأمثلة على ذلك مقابلة برادلي المهمة مع إيان ماك كالمان حول "سرد القصص في عصر الأنثروبوسين"، حيث يناقش كيفية تمثيل قضايا الأنثروبوسين وتغير المناخ بوعي (معهد سيدني للبيئة، 2016). وكما ذكر الكاتب، فإن كلمة "كلاید" مصطلح بيولوجي يشير إلى "مجموعة من الكائنات الحية ذات سلف مشترك". وبناءً على ذلك، في الرواية، هذا السلف المشترك هو آدم ليث، الشخصية الرئيسية في الفصل الأول. يقدم كل فصل وجهة نظر فرد جديد من عائلة ليث. تبدأ الرواية في المستقبل القريب، ويفصل بين كل فصل من الفصول العشرة بضع سنوات. في مجملها، تغطي "كلاید" فترة زمنية تقارب ستين إلى سبعين عامًا: وهي فترة حياة آدم.

Abstract

This paper examines ecological threats in James Bradley's *Clade* (2015), focusing on climate change and biodiversity loss across three generations of the Leith family. It explores the interplay between ecological crises and human experience through a qualitative approach informed by ecocriticism, grief theory, and indigenous studies. The novel's episodic structure highlights the social, psychological, and existential implications of climatic uncertainty, which manifest as health crises, solastalgia, and ethical concerns about reproduction and survival. Major ecological challenges, such as species extinction, colony collapse disorder in bees, and the use of genetically engineered vegetation, reveal the complex connections among human actions, technological interventions, and vulnerable ecosystems. *Clade* fosters resilience, intergenerational obligation, and the prospect of ecological renewal while criticizing capitalist institutions that perpetuate environmental degradation. Bradley advances eco-fiction by combining intimate family experiences with global concerns to raise ecological awareness and encourage contemplation of humanity's ethical duties in the Anthropocene. *Clade* has inspired several critical reviews. An example of this is Bradley's important interview with Ian McCalman on "Storytelling in the Anthropocene", where he discusses how consciously the issues of the Anthropocene and climate change are represented (Sydney



Environment Institute, 2016). As stated by the writer, the word “clade” is a biological term that denotes “a group of organisms with a common ancestor”. Accordingly, in the narrative, this common ancestor is Adam Leith, the main character of the first chapter. Each chapter provides the viewpoint of a new member of the Leith family. The novel begins in the near future, with each of the ten chapters separated by a few years. In its entirety, *Clade* has a timeframe of approximately sixty to seventy years: Adam’s lifespan

1.Introduction

James Bradley (1967-) is an Australian novelist and critic who is recognized for his outstanding ability to shift narratives from the present to the apocalyptic futures. *Clade* is Bradley’s fourth novel that concentrates on three generations of an Australian family and represents the relationship between characters and their surrounding environments. As Hiwale and Tupe (2021) observe, even though novels jump ahead by decades and changing views among generations, to strengthen the novel’s emotional impact, Bradley creates relevant characters and makes readers care about their fate.

According to Holdsworth (2023), *Clade* is not a typical dystopian narrative as it is indicative of a more plausible future that contrasts with other apocalyptic literary works. It explores the connection between ideological criticism and the perceptions of ecocritics by concentrating on the ecological consequences of capitalism. Bradley is evoking a consciousness of how financial aspects are destroying ecology in a near future. Contemporary authors “use their dystopias to encourage a new political climate in the present...” (Holdsworth, 2023, p. 3)

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2.Literature Review

The study’s literature review on James Bradley’ *Clade* seeks to identify critical debates regarding ecological threats. Ghosh (2016) argues that



ecological grief is experienced differently across demographic divisions and is affected by cultural backgrounds. Ghosh's argument is relevant to this research, as it provides a conceptual basis for understanding how the novelist represents grief not as an individual emotional reaction, but as a socially mediated experience that spans across generations in the narrative.

As stated by Sultan and Crosbie (2021), climate change fiction usually utilizes a dystopian approach to respond to the escalating environmental issues as reflected in J. G. Ballard's *The Drowned World* (1962) and James Bradley's *Clade*. Furthermore, Ballard's novel portrays ecological disasters as irreversible, and it concentrates on psychological regression and the ineffectiveness of scientific solutions. Bradley, on the other hand, implements a more measured approach that highlights continuity and the fleeting existence of optimism.

Amberge (2022) identifies that contemporary world often marginalizes nonhuman entities. Authors such as Richard Flanagan (1961-) and Alexis Wright (1950-) employ strategies that distort the relationship between human and non-human entities by showing nonhuman entities as active contributors to the experiential loss and mourning of the characters. This viewpoint reinforces the argument of this study that Bradley likewise destabilizes anthropocentric hierarchies by prioritizing the agency of the natural world. Recent scholarship, such as that of Mølgaard and Haugaard (2023), has shed more light on how cli-fi novels emerge as a critique of the Anthropocene. The researchers contend that *Clade* is notable for its examination of resilience and the evolving limits of human and non-human agency. The dystopian elements in the novel not only evoke pessimism, but also foreground the interrelation of ecological, social, and psychological challenges.

Christopher Holdsworth's thesis *The Things I Fear for Us: Australian Climate Fiction and the Emergence of Ecological Consciousness* (2023), explores the connection of capitalism and ecological changes particularly climate change in contemporary Australian fiction from an ecocritical perspective. By analyzing Bradley's *Clade*, Holdsworth examines the critical development of characters and the impact of climate change in a capitalist context.

Munro Matthew, in his dissertation *Turning the Tide: Shining a Light on Climate Change Culpability Through Cli-Fi* (2024), articulates that



Bradley's *Clade* stands out for its connection-driven narrative which unfolds through a succession of episodic stories. As each storyline revolves around the interrelated experiences of characters, Matthew examines the multidimensional impact of ecological threats on the societal structures and character's relationships. The novelist creates a palpable feeling of interdependency among his characters to promote humanity's responsibility towards the environment.

3. Methodology

The methodology conducted on James Bradley's *Clade* focuses on the novel's episodic structure to reflect the consequences of ecological risks on Adam Leith and his next generation. This study uses thematic coding to identify key motifs like the impact of capitalism on ecology and collective responsibility. It scrutinizes the scientific concepts depicted in the narrative to evaluate the effectiveness of Bradley's depiction of ecological issues as they are linked to contemporary socio-political realities. The study conducts a qualitative literary analysis approach to examine the themes of biodiversity loss and climate change.

The method is structured around models drawn from indigenous studies and ecocriticism, as explored in Lena Amberge's examination of Australian climate fiction in her thesis *Worlds of Loss: Absence and Grief in Australian Climate Fiction* (2022). Building upon Amberge's theoretical framework and a close reading method, the study will examine how Bradley's characters endure their personal and collective grief, specifically in the presence of ecological risks like climate change. Furthermore, the study incorporates interdisciplinary approaches to intensify the method. As does Amberge, visions from native studies will be combined to consider how indigenous experiences with climate shifts vary from those of settler progenies. In addition to textual analysis, the study employs secondary sources, including dissertation, thesis, articles, and relevant theoretical literature, to offer a contextual basis for the narrative.

4. The Interrelation Between Climate Change and Species Extinction

4.1. Loss of Biodiversity

The writer addresses several critical ecological risks like the rise of genetically engineered vegetation, bee colony collapse disorder, and biodiversity loss with the anxieties experienced by its characters. Technological progress, while providing solutions, is also shown to accelerate these environmental risks, creating a world fraught with



indecision and uncertainty. For instance, after the tragic loss of Maddie's three-year-old son, Ellie gets increasingly concerned with her daughter Summer maturing in difficult times: "they seem so closed off, these kids like they've grown up too fast. It frightens me" (*Clade*, p. 43).

The writer's vivid representation of dawn and the various sounds of birds like "kookaburras", "cuckoos", and "cockatoos" conveys a rich biodiversity that once existed in the area. The importance of these species is mirrored in the characters's daily lives and psychological well-being. However, the steady extinction of bird species is a powerful metaphor for the environment's decline. Climate change also causes agricultural issues, as seen in the rise of coffee prices. "Since the crop failures three years ago, coffee has become increasingly expensive and difficult to get" (*Clade*, pp. 37-38). These concerns disrupt the livelihood and nutrition system.

Tom's concern about the decreased reproductive success of the bird population implies his knowledge of environmental shifts and their effects on local fauna:

They might look fine but they've stopped breeding, or if they're still breeding their eggs aren't hatching, or the heat is killing the chicks. The ones you can see here are adults because they're all that's left, and when they're gone that will be the end of them. They're a ghost species. (*Clade*, p. 52)

Tom's observation about the loss of biodiversity and the aftermath of climate change presents a critical distinction between species' visible presence and their overall ecological well-being. In other words, his expression reveals that superficial stability often conceals greater tragedies. The term "ghost species" evokes a haunting sense of loss that demonstrates species extinction which often cause emotional grief for what once existed. Tom's anger with Maddie's flippant attitude illustrates a further critical issue in ecological discourse: the need for people to face awful realities about their impact on the natural world.

The writer uses Li Lijuan to reflect on the impact of climate change. Li Lijuan's observations and descriptions of her arrival to the forest represent the changes in the surroundings, like the force of flood and its accompanying diseases, such as malaria and cholera. She conveys a sense of emptiness in the natural setting, believing that "once there would have been birds and things through here, but now they're gone it's so quiet all



you can hear is the leaves moving in the breeze” (*Clade*, pp. 138-139). The consequences of climate change and loss of biodiversity can also be seen in transforming rivers into lakes filled with dead plants and trees. Li Lijuan’s fear of being constantly watched symbolizes the breakdown of social values and surveillance in the digital world as she wonders “how long the software agents and AIs would keep running if we all died” (*Clade*, p. 139).

While Li’s experience depicts the alienation that comes with technology and ecological collapse, Ellie’s story provides a different perspective that points to reconnecting with nature. After moving into a new house, Ellie’s interactions with her surroundings, bees, and beekeepers reflect her environmental curiosity. She observes negligence and the effects of human activity on landscapes. Bradley describes a transition from human control to natural processes. When agricultural practices fail, the landscape is left to heal on its own, this implies the prospect of ecological regeneration, with native species reestablishing themselves and expanding biodiversity. “When the schemes went bankrupt the planting was abandoned, and the land left to run wild, the only reminders of its former lives the straggly rows of trees and the old farm buildings scattered here and there amongst them” (*Clade*, p. 97).

The recollections of previous human endeavors represent the transient nature of agricultural systems and their unsustainable environmental impact. The contrast between man-made structures and the wild environment demonstrates the clash between human development and natural forces. The expression “left to run wild” connotes a return to a more natural condition where ecosystems can recover and promote biodiversity as numerous animal and plant species reclaim the area. This calls into question the usefulness of wild regions in an increasingly regulated environment.

Yet the fragile equilibrium between the restoration of natural environments and the destructive interference of humans soon shifts to a darker vision of ecological breakdown. The writer depicts the physical damage of urban infrastructure, as well as the erasing of communities and history. The mention of the graveyard denotes finality and grief, and it evokes the ecological and cultural losses suffered by those uprooted by floods. Additionally, the land expansion by about half a kilometer signifies the extent of the degradation. Bradley encourages readers to immediately contemplate sustainability and conservation in order to avert



further ecological harm. He shows the repercussions of ecological neglect and the condition of displacement experienced by myriad populations worldwide.

4.2. Bee Colony Collapse Disorder

Bradley utilizes the plight of bees as a powerful metaphor for the interconnected issues that human civilization and ecosystems are currently facing. In addition to functioning as an ecological warning, the apparent demise of bee colonies offers a lens through which the novel explores themes of survival, dependence, and displacement. Bradley stresses the tight relationship between ecological and social disturbances by drawing parallels between instability in the environment and the precarious lifestyles of those forced to move.

This conceptual framework is further illustrated in the chapter entitled “The Keeper of Bees”, which is concerned with Ellie’s friendship with Amir, a doctor who later became beekeeper and is in the country without legal status.

Tonight she finds herself assailed by it all over again, by the descriptions of the camps, the random harassment by police, the detention and forced expulsion of anyone the government deems undesirable. It is ridiculous, monstrous. Where, after all, are those who have sought refuge here meant to go? (*Clade*, p. 116)

Through Ellie and Amir’s thriving relationship, the author converts abstract concepts like displacement and ecological vulnerability into intimate, lived realities. Their common beekeeping experience functions as a medium to understand how knowledge, empathy, and reverence for nature can help people stay resilient during crisis. Amir’s meticulous planning for interacting with the bees, wherein he wears beekeeping suit and uses smoke to keep bees calm during hive inspections, and this indicates his concern for nature. His activities reveal his extensive knowledge and understanding of bees as sentient animals with different actions and memories. Ellie’s suspicion is refuted by Amir’s assertion that bees are able to recognize and recall him, which prompts reflection on the complex interactions found in ecosystems. Ellie’s passion for nature grows as she observes her first honey harvest and is struck by the intricacies, such as the thick, golden material with its sweet flavor. Ellie is filled with awe at this moment, which reminds her of a period when human life was perfectly synchronized with natural cycles.



Ellie's creative endeavor reveals her desire to use modeling and photography to document and research the world of bees. Amir's interest in her studies suggests that common interests can strengthen relationships between people and could lead to a partnership that will entwine their lives. The narrative, however, contrasts this bond with Ellie's emotional challenges and obligations to Noah, and an example of this can be when Ellie discovers that Noah is missing.

While engaging in their scientific and artistic endeavors, Ellie and Amir soon find their conversation turning toward the central subject of their collaboration: the bees. Amir describes colony collapse disorder (CCD) and shares his personal experience as a doctor in Bangladesh and the passing of his family, which deepens his character and emotional attachment to the bees. Ellie interacts with Amir's views by asking questions and expressing empathy for his personal background and sentiments, particularly in light of the bee ecological disaster:

Nobody knows. Some people believe it's due to toxicity, chemicals in the environment. Others say it's about climate. Some think it's viral, or a combination of all three.... Some species seem to be more resistant, especially the native bees. But last summer the native colonies started collapsing as well. (*Clade*, p. 113)

Amir's role as a scientific researcher allows Bradley to depict the difficulties researchers encounter in determining the explanations for events such as colony collapse disorder (CCD). The environmental toxicity and chemicals indicate the influence of manmade elements, such as pesticides and pollutants, on ecosystems. Packer (2010) has pointed out that both urban areas and low-input agricultural lands, frequently offer complex habitat that can benefit bees. Climate change can disrupt habitats, reduce food availability, and make species more susceptible to illnesses and pests. Their dialogue about resistant species, notably native bees, emphasizes the value of biodiversity in preserving ecological resilience. However, the disturbing observation that "native colonies started collapsing as well" (*Clade*, p. 113) indicates that even hardy species are vulnerable to the larger effects of ecological stressors.

5.The Interrelation Between Climate Change and Solastalgia

The importance of *Clade* lies in its association with other fields of science and the humanities. This can be observed in the characters' experiences with solastalgia which is the distress brought about by ecological changes

triggered either by natural disasters such as floods, fires, and droughts or human-induced causes like war, mechanization, urbanization, and institutional changes (Albrecht et al., 2007). Ellie's emotional distress deepens especially after the disappearance of her daughter and the condition of global affairs like war and environmental catastrophes that disturb people's sense of familiarity and place. For Hiwale and Tupe (2021), the writer's use of symbolic language distinguishes his work by making it both emotionally resonant and technically unique.

Furthermore, in the narrative, the lives of the characters are characterized by urbanity and technology, which has created a sort of disconnection between characters and nature. By using the concept of time, the writer prompts readers to consider humanity's transitory existence in the context of geological epochs. Such an idea challenges the anthropocentric account, which suggests that while individual lives are significant, they are insignificant against the impressive natural schemes. Therefore, humanity's recognition of their ultimate insignificance provokes existential contemplation that makes them challenge their responsibilities within the continuing climate crisis (Mølgaard and Haugaard, 2023).

Michael (2017) explains that it is not surprising that many literary cultures have environmental elements and are infused with stories of apocalypse, given the growing incidences of fires, floods, and drought. Adam's experience in the cold carries a strong sense of solitude that reflects the existential threats of his age. The narrator states, "the cold strikes him like a physical thing" (*Clade*, p. 3). The harsh effects of climate change are brought to light by the cold. However, the bitter cold that he experiences is more than just a bodily sensation; it also symbolizes his psychological estrangement from nature and his life. The elephant seal and the freezing ice water are contrasted with the marks left by human activity, tracks in the snow, to show the enduring contrast between the splendor of nature and human meddling.

The novel shows how human activity commonly impacts natural ecosystems, creating nostalgia for what has been irreparably altered, rather than merely portraying nature and humanity as antagonistic forces. Adam's reflection on the solstice festivities reinforces this subject further; the celebration marks a cyclic appreciation of life, but it also symbolizes the arrival of winter and the relentless loss of warmth and light. "Humans have observed the solstice for tens of thousands of years, but are those festivities truly celebrations, or something more ambivalent? Symbols of



loss.... the solstice also marks...summer's end...the year's long retreat back into the dark” (*Clade*, p. 3).

Bradley associates human feelings and emotions with the state of the natural environment, especially Maddie's internal condition. Maddie's feelings of nostalgia and memories of a vacation with her husband in Kashmir are juxtaposed with her current state. She “hears the car on the drive, and the afternoon wind is already up, the trees shifting and breathing in long restless waves. For a few seconds she doesn't move, just sits listening, unwilling to relinquish her privacy quite yet” (*Clade*, p. 31). Her initial disinterest in the protests against beach erosion points out to the difficulty of dealing with environmental problems rationally. Her indifference reveals a mismatch between the seriousness of ecological issues and personal reactions. However, her realization that there is “something beautiful in this ruination” suggests a deeper investigation into how destruction may provoke complex emotions (*Clade*, p. 32).

The characters in the novel cope with both extremely personal issues and obstacles from outside sources. For instance, Noah displays outward signs of anxiousness or a neurological disorder, such as repetitive hand gestures and facial tics. Bradley aims to show that ongoing crises like societal instability and natural calamities increase individual struggles. “It didn't help that the world seemed to be falling apart as well, the floods in England followed by deluges in northern Europe and Burma, the escalation of the war in the Middle East and the horrors in Chicago” (*Clade*, p. 105). The novel connects general ecological and geopolitical issues to individual misery. It suggests that global problems often mirror personal problems and it expresses a feeling of disorder that transcends human experience.

Bradley depicts the increasing severity of dangerous weather condition, which is typically caused by climate change. The author emphasizes the human implications of conflict, which are frequently associated with environmental difficulties such as limited resources and displacement. This demonstrates how ecological deterioration can strengthen societal tensions, leading to bloodshed and misery. The combined impact of these issues creates a sense of impotence for people like Ellie who battle with despondency in the face of major global concerns. This shows the psychological weight that ecological damage can place on individuals, impairing their ability to deal with personal issues.

In the midst of these overwhelming challenges, Dylan notices that “the houses and flats are run-down, the wide streets mostly empty” (*Clade*, p. 169). His observation refers to his society’s implication by the socioeconomic downfall and environmental degradation in the aftermath of post-pandemic. Dylan witnesses a frightening scene when his mother turns off the light, and he hears her coughing. His mother’s coughing represents not just the illness but also the isolation and societal disconnection one may experience in the face of ecological unwellness. His father is required to wear gloves and a mask, which indicates the widespread health crisis due to the outbreak of the pandemic and pollution. The depiction of decaying houses and fading tributes to the dead shows a larger context of loss in which personal calamities are combined with the woes of their surrounding area. Dylan’s reaction exposes how strongly the connection and disconnection of nature and human life influence personal experiences.

6.The Interrelation Between Climate Change and Man’s Infertility

Climate change, nowadays, is one of the ongoing ecological threats that has greatly attracted the attention of writers, critics, scientists, and politicians. In accordance with Woodrow (2019, p. 31), cli-fi novels usually employ the form of episodic structure. *Clade* is composed of loosely connected short stories spanning various generations, adversities, events, and continents. The impact of climate change is shown in several interrelated ways across different generations. For instance, a variety of animal and plant species go extinct as a result of ecological disruption brought on by rising temperatures and habitat loss. Changes in weather patterns and glacier melting increase the frequency and severity of floods, endangering populations and agricultural stability. Epidemics arise when climate change expands the habitats of disease vectors or weaken public health systems. Simultaneously, flooding, drought, and resource scarcity render whole regions unlivable, producing climate refugees and forcing people into displacement.

Bradley makes the concept of the Anthropocene more relatable to readers by focusing on the perspectives of children within the narrative through the use of the trope of the child. The writer, for instance, begins the novel with the story of Adam and Ellie to conceive a child through IVF, which questions the ability of individuals to consider the effects of making a child in a world threatened by ecological instability (Woodrow, 2019, p. 32). This method allows readers to explore themes of intergenerational



responsibility and utilize the family's decision as a lens to look at more general concerns about stewardship.

Bradley is deeply occupied by the impacts of climate change. *Clade* opens in Antarctica during the solstice, where Adam Leith, a climatologist, is collaborating with a team of scientists on a project "to develop a better understanding of the continent's climate during previous periods of warming" (*Clade*, 14). Adam's scientific work makes him reflect back on his marriage with Ellie whom he met during college years. While Adam is engaged in his experiment, Ellie remains in Sydney, undergoing IVF treatment due to the couple's challenges with infertility. Changes in nature affect a person's ability to reproduce children. Qian et al., (2025) found a strong spatial correlation between the prevalence of male infertility and elevated divergence from normal temperature levels. This implies that as temperatures rise globally, the rate of male infertility is likely to increase.

Moreover, contact with ecological substances including endocrine-disrupting chemicals, heavy metals, and industrial toxins can negatively influence reproductive health. Ovarian issues and reduced sperm quality are caused by these contaminants, which also cause oxidative stress, disrupt hormonal balance, and harm reproductive cells. Similarly, chemicals that affect hormone systems can cause irregularities and raise infertility rates among both men and women. The novel depicts infertility as a serious personal issue that resonates with the ambiguity and variation in a world handling ecological concerns.

After coming back to Sydney, Adam and his partner Ellie decide to have a baby through IVF. The couple's wish to have a child is further complicated by the anxieties of living in an unpredictable setting and biological experiments. Five years after their initial struggle, Adam and Ellie start to have a small child called Summer, they reflect on the political and environmental changes over the last few years. This decision brings dramatic changes in their lives after the birth of the baby. The couple's concern about their child's future is intensified by ecological changes (Hiwale and Tupe, 2021). As Demeulenaere (2019) confirms, observations of such kind are interspersed throughout the novel to give readers a sense of the rapidly changing world. This sense of change further continues through Maddie's perspective, Ellie's stepmother. About ten years later, Ellie and her daughter visit Maddie at her beach house to scatter the ashes of Tom, Ellie's father. The study examines the



tense relationship between Adam and Ellie; they appear to grow increasingly apart.

According to Sultan and Crosbie (2021), *Clade* offers a profound reflection on character developments, thematic structures, and particularly ecological threats. In the narrative, the characters suffer from direct and indirect implications of ecological deterioration through various health crises such as infertility and respiratory ailments. One of the key features of *Clade* is its emphasis on the future and the obligations of the contemporary generation to alleviate and address ecological threats. Through the characters' reflections on their children's future, the author predicts a world that may be less welcoming and harsher due to the abandonment of past generations. In a time of division and uncertainty, the novel explores how Adam and Ellie manage their parental responsibilities. Bradley paints a bleak picture of the terrain, but he also includes hints of optimism. The characters' tenacity and hardships show how humanity can adjust to new situations. Balancing despair with a strand of optimism, as Sultan and Crosbie (2021) further note, is crucial for seeking transformative change.

Holdsworth (2023) confirms that anthropogenic climate change poses a serious threat to contemporary civilization. Bradley applies dialectical materialist principles, particularly those of Marx and Hegel, to show how ecological changes and socioeconomic factors intersect. Families in the novel struggle with economic instability, ecological risks, and the consequences of decision making. This mirrors the dialectical materialist concept that individuals are shaped by changing material conditions. For Holdsworth (2023), climate fiction must develop beyond raising awareness to bring reformation, social reflection, and actionable insights.

Bradley also depicts political problems that stem from the changing climate, water and food scarcity, and the existential and philosophical question of making children in turbulent times. Each chapter of the novel confronts the ramifications of a gradually changing world. This generational viewpoint is further deepened through the year-long journal of the plague sustained by sixteen-year-old Li Lijuan during a noteworthy public health crisis. Li Lijuan's mother is Noah's caregiver, but when she returns to China, Li Lijuan assumes her responsibilities. Noah has grown gradually reliant on virtual reality worlds called "virches". In China, a virus breaks out and spreads worldwide which will later leave severe consequences regarding public health crises. While those like Adam,



Noah, and Li Lijuan find methods to stay safe, millions, including Li Lijuan's family, endure heartbreaking losses. This shows the influence of pandemics on both individuals and global civilization.

Mølgaard and Haugaard (2023) observe that species extinction, such as the loss of birds, serves as a metaphor for the impact of climate change because the loss of a life means the loss of the whole ecosystem upon which it relies. As human survival depends on agricultural steadiness, the immediate ramifications of climate change will affect the rise of food shortages. The fragility of humanity's dependence on invariable ecological conditions carries a critique of contemporary agricultural practices.

This theme of ecological instability is further explored through the personal lives of the characters. The intimacy that once existed between Adam and Ellie in the early stages of their relationship is soon replaced by a sense of discomfort, in particular after the unexpected death of Ellie's friend Holly from a brain tumour. As the narrator says, "it often seemed their life together had been reduced to this enervating cycle of biology and technology" (*Clade*, p. 11). An intense fear of the future is revealed by Adam's inner voice and his quandary over raising a child in a world plagued by environmental crises. His concerns about biodiversity loss, extreme weather, and melting ice sheets illustrate their predicament and the moral significance of his wish to procreate:

In the Arctic the permafrost was melting: in Greenland and Antarctica the ice sheets were destabilising.... Even the oceans...seemed to be dying, their waters more acidic.... In the United States and India floods covered millions of square kilometres, in Africa and Europe the heat was growing ever more intense, in Indonesia and Brazil and Malaysia the forests were burning.... What sort of world would that child inherit? (*Clade*, p. 13)

Adam's final choice to go on an Antarctic expedition represents a means of escaping both the startling scope of the world's ecological issues and mental instability in his relationship with Ellie. The journey is a symbolic attempt to confront the realities of climate change in addition to being a physical challenge. Adam's concerns about the future represent a worldwide dread of losing biodiversity, the threat of increasing population, and cultural indifference to ecological problems.

To address these concerns, Adam's research examines the climate history of Antarctica through "fossilised plants and traces of ancient pollen" to look into the land's enormous transformations—shifting "from lush

rainforest to tundra”, eventually leading to “the barrenness” surrounding him. As Adam journeys south, he witnesses the stunning shift from temperate seas to the frozen vastness of the continent. The visual of darker, thicker waters changing into drifting ice fields captures nature’s raw beauty and the grave effects of climate change (*Clade*, p. 14).

The narrator states, “This year the ice has retreated further than ever, exposing rock and stone buried for millions of years” (*Clade*, p. 15). The scientists’ common sense of urgency about their research in light of the accelerated retreat of ice is a frightening sign of climate transformation. The emotional instability of Adam exposes how environmental degradation affects people psychologically. This dichotomy reflects a common human response to ecological crises: wonder and fear coexist, which inspires both reflection and action. Adam and Ellie’s difficulties with unsettling power interruptions and extreme heat, which jeopardize their comfort and increase their sense of helplessness, mirror their mental anguish: “For the past few summers there have been intermittent outages caused by the ever-increasing demand for air-conditioning, but the fires of recent months have damaged the lines, making brownouts and outright power failures common” (*Clade*, p. 20).

An example of a systemic malfunction and the strain that climate change is placing on infrastructure is the increase in power demand during severe temperatures. Communities are ill-equipped to deal with the challenges posed by global warming. The author shows how populations are directly impacted by unfavorable weather and infrastructural problems as a result of climate change. Summer’s asthma indicates health risks associated with environmental factors that might increase respiratory issues, such as heat and pollution. Ellie’s unwillingness to ask for assistance highlights the psychological toll of living in a volatile environment.

Threats to the environment put family ties to test. The allusion to South Asia’s catastrophic weather, which has caused food scarcity and a recession, works as a striking reflection of the global effects of climate change and lends credence to the idea that these problems are not isolated but instead a component of an interconnected system. People use air conditioners more frequently as temperatures rise, which increases energy use. Thus, the narrative addresses sustainability concerns and the need for a better energy infrastructure.

The rains that usually arrived in July or August failed to appear.... Crops failed, leading to food shortages and starvation. Then in November



torrential rain and massive floods killed more than a million.... And finally, in the aftermath, the economy collapsed, leading to the widespread unemployment.... (*Clade*, p. 21)

The catastrophic consequences of climate change is intensely represented through the erratic monsoon rains in South Asia. In addition to causing severe drought conditions, the absence of expected rains has influential effects on agriculture, nutrient security, and financial stability. For instance, crop failure can result in humanitarian catastrophes and mostly affect underprivileged populations, posing grave questions about equity and justice.

A significant and alarming trend in global warming is shown by the changing climates in terrestrial and oceanic environments, which may lead to diminished habitat and the extermination of species. An illustration of respiratory issues, particularly in susceptible individuals like children, is the instance of Summer's breathing incident: "Summer's breath comes in shallow gasps and the skin around her mouth is blue.... By the time they get home.... the house is hot, the air thick with the stink of rotting food" (*Clade*, pp. 23-24). The smell of rotting food means that infrastructure is unable to address contemporary climate-related issues. It becomes a metaphor for the greater ecological disaster and shows that the consequences of system failure can be both personal and catastrophic.

Adam's condemnation of social media platforms mirrors his anger at the way misinformation about climate change is disregarded on television. His response clarifies how the media shapes public opinion and the risks associated with disseminating false information. "The media...everybody knows that.... they're irresponsible. No, more than that, they're dangerous. It's not just that they're scientifically ignorant, it's that they work to actively obstruct change. They're like a cancer" (*Clade*, p. 25). The author's portrayal of the characters' individual experiences reflects this criticism.

The band have a van, so they bundle in the back with the gear from the show, the electric engine straining as they speed away through the streets. In the darkness Meera slips a pill into Summer's mouth, and she throws her head back and swallows. The air is warm, heavy with the smell of smoke from the fires that have been burning on the city's fringes for the past week. (*Clade*, p. 59)

The writer exposes more profound implications of their situation through the description of the electric engine, which implies the band's reliance on technology and modern infrastructure that represent both an escape from everyday life and the stresses of urbanization. Meera's behavior of putting a tablet in Summer's mouth symbolizes adolescent urges to pursue pleasure during calamity and this shows their negligence and escapism. However, fires are a sharp reminder of the ongoing ecological crisis, this personal escapism unfolds in a world teetering towards collapse.

If current ecological threats continue, as Adam foresees, "the planet's ecosystems could reach a point where they simply began to collapse" (*Clade*, p. 115). He explains that even the inclusion of a slight factor to the equation can lead to a transitional phase in the way that one tiny snowflake can set off an avalanche. For him, the die-out of birds and frogs, the loss of marine species, the melting ice, and the shifts in the climate are all warning signs. Adam believes that in time, something would induce a parallel downfall to the human population.

Dylan attempts continuously to find answers concerning the root cause of a lethal virus. There are different views; some people think "it escaped from a lab in Taiwan, or... the Netherlands. Others say...it was released by one of the numerous terrorist groups" (*Clade*, p. 162). However, he believes that discovering the virus's origin will not decrease its real influence or restore lost lives, particularly after his mother's death. Despite the precautions his parents took to avoid infection, his mother became ill just before the antibody discovery was announced. Dylan's description of a difficult time when his mother had to refuse to help a desperate woman to protect the safety of her children by instructing him to wait inside shows how humanitarian values get shattered in the face of a pandemic crisis. Although the woman's pale and sweaty face proved her grave condition and evoked compassion, his mother remained adamant. The narrative explores how moral dilemmas can occur when fear and defensive instincts collide with empathy. His mother's reluctance shows an internal conflict between compassion and the need to protect her own family, and that eventually compels her to reject the woman's plea for assistance.

Noah is captivated by the ramifications of a mysterious light they have seen on their final night at the observatory array, where their peers fete him and Jin. Noah sees an incoming storm system and finds comfort



beneath the stars. The “movement of the weather, the march of the seasons, the long oscillation of climate systems, their cycles repeated over and over” (*Clade*, p. 197). Noah thinks about the nature of the physical world and comes to the conclusion that nothing is static. He views the desert as a replica of the cosmos, filled with nostalgic elements and a contemplative silence. His transformation from fear to thankfulness shows personal development as he discovers purpose in the vastness of the universe and the desert.

Many species rely on seasonal clues for migration, hibernation, and mating. The transition of the seasons is crucial for maintaining biodiversity since it shows the consistency of natural cycles. Natural variations in weather patterns, such as El Niño and La Niña, are indicated by the long fluctuation of climatic systems and can have a significant impact on ecological systems and worldwide weather conditions (Clarke, 2008). While these cycles show that ecosystems are durable, they also point out the possibility for manmade changes to disturb ecosystems, which may have unexpected effects on biodiversity.

Noah expects a significant difference between future and current generations by visualizing a time when people attempt to explore more about the Earth, similar to ancient civilizations. Noah expresses:

The ice is almost gone, but while it may take millions of years, there is little doubt that one day it will return, creeping back to cover the land, and the world will change once more, the turmoil and destruction of the past century being little more than a spasm, an interregnum in the great cycles of the planet's existence. (*Clade*, pp. 197-198)

Despite the writer's primary focus on how current climate change affects the cyclical nature of the planet and causes noteworthy ice melt, he further prompts attention to the continuing cycle that extends millions of years. Noah perceives the tension between the threatening ecological crises and human concerns. He contemplates the future by holding a serious concern for humanity's survival despite the rising crises like deforestation and melting ice. “The planet's crust is shifting, buckling and cracking as the weight of the ice recedes” (*Clade*, p. 201). As temperatures increase, ice sheets and glaciers melt at unparalleled rates, and this results in reducing the weight of the earth's crust. Consequently, loss of pressure will make the crust move and crack.

Moreover, ice melting will cause rising sea levels that threaten species and coastal habitats. The destabilization of the planet's crust can also lead to geological disasters like landslides and earthquakes. The interconnectedness among geological courses, climate change, and ecological stability indicates the fragility of the planet's system and the catastrophic impacts that man-made climate change has on ecology and society.

Conclusion

The study's analysis of James Bradley's *Clade* has shed light on the ecological risks and the development of climate fiction as a genre. *Clade*, which spans multiple generations of the Leith family, is an examination of humanity's persistent desire to alter the natural world as well as a literary meditation on the Anthropocene. The research has drawn attention to the psychological, social, and existential consequences associated with biodiversity loss, climate change, and advances in technology through this episodic structure and various points of view. It has also raised concerns about the shortcomings of capitalist systems in successfully tackling ecological threats.

The writer has portrayed how characters represent the moral responsibilities and emotional difficulties of living in a time filled with ecological instability by integrating ideas from ecocriticism and indigenous studies. The portrayal of broken family bonds and nostalgia conveys the rise of uncertainty that characterizes current dangers of ecosystem. Ultimately, *Clade* is an important piece of climate fiction from Australia and around the world that encourages readers to reevaluate their responsibilities and roles in their specific communities.

The paper has revealed the changing function of eco-fiction in connecting feelings, science, and narration. Since eco-fiction transcends the boundaries of art, it has become an effective tool for scientists, prose writers, and policymakers alike. *Clade* offers important insights and cautions about the planet's uncertain destiny. The novelist emphasizes the significance of group responsibility and creative reactivation with the future while capturing the fears of the present by fusing human tales with environmental issues. This study confirms the ability of cli-fi to foster ecological awareness and to stimulate contemplation of the interconnected fates of the earth and humans.

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