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Spatiotemporal Construction and Ecological Reflection in Climate Narratives of The Long Summer in the Anthropocene

Ying Liu
School of Language, Culture and Communication, Hunan University of Technology, China

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Abstract

The advent of the Anthropocene marks that human activities have become the core force shaping the Earth's geological and ecological systems, and the climate crisis is its most intuitive manifestation. Kim Stanley Robinson's The Long Summer, grounded in rigorous scientific narration, constructs a literary world that confronts global warming head on, establishing itself as a classic text of contemporary climate fiction. Through layered construction of diverse spaces and artistic arrangement of multi dimensional time, the novel achieves a concrete representation of the Anthropocene climate crisis. Its spatiotemporal narration is not merely a formal innovation but a core carrier of ecological critique and value reconstruction. Supported by ecocriticism and ecological narratology, this paper analyzes the spatial forms and temporal logic of climate narration in The Long Summer within the Anthropocene context, explores the ecological reflections and value orientations embedded in its spatiotemporal narration, and interprets the novel's literary response to the ecological dilemmas of the Anthropocene, so as to provide theoretical references and textual models for the study of contemporary climate fiction and the construction of ecological culture.

Keywords

Anthropocene; The Long Summer; climate narrative; spatiotemporal construction; ecocriticism; ecological narratology

Introduction

I. Research Background: The Literary Turn of the Anthropocene and the Climate Crisis

Since the Industrial Revolution, the predatory exploitation of natural resources and the unrestrained growth of carbon emissions have completely disrupted the natural balance of the Earth's ecosystem. In 2000, Paul Crutzen, Nobel laureate in chemistry, formally proposed the concept of the Anthropocene, arguing that humanity has become a decisive geological force reshaping the Earth's surface systems, and the planet has entered a human-dominated geological epoch. The defining feature of the

Anthropocene is not mere environmental damage, but the systematic intervention of human activities in climate, soil, oceans and biodiversity. Such intervention has exceeded the self-repair threshold of natural ecology, triggering cascading crises including global warming, glacial melting and frequent extreme weather events, making the climate crisis the most disruptive epochal issue of the Anthropocene.

Under the real pressure of the climate crisis, literature has witnessed a remarkable ecological turn, from which climate fiction (Cli-Fi) has emerged as a branch of ecological literature. Breaking away from the lyrical paradigm of traditional nature writing, climate fiction centers on the climate disasters of the Anthropocene, reconstructing the realistic logic, social impacts and psychological shocks of the climate crisis through literary narration, thus serving as a vital bridge between scientific knowledge and public awareness. The American writer Kim Stanley Robinson is a leading figure in contemporary climate fiction. Rooted in ecological science and social reality, his works combine rigorous scientific literacy with profound humanistic concern to explore pathways for addressing the climate crisis in the Anthropocene, earning him the reputation as "the founder of climate fiction".

II. Textual Positioning: The Value of Climate Narration in *The Long Summer*

The Long Summer is a major representative work of Robinson's ecological writing. Continuing his consistent style of scientific narration, the novel is set against the backdrop of global warming in the 21st century, focusing on scientific exploration, political games and social transformation in human responses to the climate crisis. Unlike Robinson's other utopian ecological novels, *The Long Summer* abandons illusory science-fiction imagination and draws on real climate science to depict a survival scenario marked by rising global temperatures, accelerated polar ice melt, collapsed agricultural production and fragmented social classes, revealing the reality and urgency of the Anthropocene climate crisis.

The core appeal of the novel lies not in mere disaster depiction, but in the artistic construction of spatiotemporal narration, which transforms abstract climate science into tangible literary experience, allowing readers to intuitively perceive the ecological predicaments of the Anthropocene. Current academic research on Robinson mostly centers on his classic works such as the *Mars Trilogy* and *New York Trilogy*, while studies on *The Long Summer* remain relatively insufficient. Existing scholarship tends to focus on themes such as ecological justice and scientific spirit, lacking systematic analysis from the spatiotemporal dimension of ecological narration. In fact, the spatiotemporal construction in *The Long Summer* is not a mere narrative backdrop, but a core carrier of climate critique, ecological reflection and value reconstruction. Its deep coupling between spatiotemporal narration and Anthropocene theory constitutes the novel's unique artistic and ideological value.

III. Research Significance and Methodology

Taking Anthropocene theory as its core framework, this paper integrates ecocriticism, ecological narratology, spatial theory and the philosophy of time. Using close reading, interdisciplinary research and theoretical interpretation, it systematically analyzes the spatiotemporal construction of climate narration in *The Long Summer* and excavates the logic of ecological critique and value pursuit behind its spatiotemporal design. Theoretically, this study enriches narrative research on climate fiction in the Anthropocene and expands the boundaries of ecological narratology. Practically, by interpreting the novel's ecological reflections, it provides spiritual guidance from a literary perspective for contemporary society's response to the climate crisis, highlighting the practical significance of ecological literature.

1. Theoretical Coupling Between the Anthropocene and Climate Narration

1.1. The Anthropocene: An Epochal Definition of the Ecological Crisis

The proposal of the Anthropocene has subverted traditional understandings of the human-nature relationship. Before the Anthropocene, the Earth's ecosystem followed natural evolutionary laws, and humans were merely part of nature. In the Anthropocene, however, human activities including industrial production, technological development and resource consumption have become the dominant force shaping the Earth's geological structure, climate system and biological cycles. Crutzen clearly states that the Anthropocene began in the late 18th century with the Industrial Revolution. The popularization of the steam engine and the large-scale use of fossil fuels marked the onset of humanity's geological impact, and the subsequent two centuries of modernization have further intensified human transformation and destruction of the Earth's ecology.

The essential nature of the Anthropocene is the extremization of anthropocentrism. Within the discourse of Western modernity, humans regard nature as an object to be conquered, transformed and utilized, upholding the value of "human supremacy" and pursuing infinite material growth while ignoring the intrinsic value and survival rights of natural ecology. This anthropocentric mindset directly caused the climate crisis: unrestrained carbon emissions have intensified the greenhouse effect, raising global average temperatures; melting polar ice has driven sea-level rise; and extreme heat, droughts and floods have become normalized, threatening humanity's existential foundation. The Anthropocene is therefore not only a geological epoch but also a reflection on modern developmental models and a critique of anthropocentrism.

1.2. Climate Narration: A Contemporary Form of Ecological Narration

Ecological narration is the core expressive form of ecological literature, centering on the "human-nature relationship" to convey ecological ideas, criticize ecological destruction and reconstruct ecological values. As a contemporary branch of

ecological narration, climate narration focuses on the core issue of the Anthropocene climate crisis, bearing distinct epochal and scientific characteristics. Different from traditional ecological narration, which emphasizes natural lyricism and pastoral writing, climate narration has three defining features:

First, scientificity. Grounded in climate science, geology and environmental science, climate narration rejects unscientific fantasy, restores the formation and evolution of the climate crisis through precise scientific details, and achieves a unity of literariness and scientificity.

Second, reality. Climate narration confronts real-world problems of the contemporary climate crisis, focusing on practical issues such as carbon emissions, climate governance and ecological justice, closely integrating literary narration with social reality and demonstrating literature's real-world concern.

Third, spatiotemporality. The climate crisis is a systemic crisis that transcends space and time, involving ecological interconnectedness across global geopolitical spaces and temporal continuity between the past, present and future. Climate narration thus necessarily centers on spatiotemporal construction, using artistic arrangements of time and space to present the holistic and far-reaching nature of the crisis.

1.3. Internal Connection Between the Anthropocene and Climate Narration

The Anthropocene provides the epochal context and theoretical foundation for climate narration, while climate narration offers literary expression and emotional carriers for ecological reflection on the Anthropocene, forming a deeply coupled internal relationship. On the one hand, the arrival of the Anthropocene has turned the climate crisis from a potential threat into a tangible reality, providing thematic and material resources for climate fiction. The core mission of climate narration is to interpret the ecological dilemmas of the Anthropocene and critique anthropocentric development models. On the other hand, through the perceptual power of literature, climate narration translates abstract Anthropocene theory into concrete character fates, living scenes and social landscapes, breaking barriers between scientific discourse and public understanding, enabling readers to directly experience ecological oppression in the Anthropocene and stimulating ecological reflection and action.

Robinson's *The Long Summer* exemplifies the deep integration of the Anthropocene and climate narration. With the Anthropocene climate crisis as its narrative background and scientific narration as its expressive form, the novel reconstructs the full landscape of the crisis through unique spatiotemporal construction, revealing both the cruelty of climate disasters and the possibility of human escape from ecological predicaments, making it a classic text of climate narration in the Anthropocene.

2. Spatial Construction of Climate Narration in *The Long Summer*

Space is a core dimension of ecological narration and an important vehicle for climate narration to represent Anthropocene crises. *The Long Summer* breaks the single spatial narrative model of traditional fiction and constructs a pluralistic spatial system integrating physical space, social space and mental space. These interwoven and interactive spatial forms collectively present the systematicity and complexity of the Anthropocene climate crisis, accomplishing a spatialized critique of ecological destruction.

2.1. Physical Space: Fragmentation and Imbalance of Natural Ecology

The novel's physical space is rooted in the Earth's natural ecology, focusing on the transformation of natural spaces under the climate crisis. Through contrasting depictions of polar space, wilderness space and urban space, it reveals the systematic destruction of natural physical space in the Anthropocene.

Polar space serves as an early warning space for the climate crisis. The Antarctic and Arctic, as the Earth's "cooling systems", are crucial to climatic balance and among the most sensitive regions to Anthropocene ecological damage. In the novel, global warming accelerates polar ice melt; large-scale ice shelf collapse occurs in the perpetually frozen polar regions, and freshwater from melting glaciers flows into the oceans, disrupting ocean circulation patterns and triggering global climatic chain reactions. With precise scientific details, Robinson portrays the transformation of polar space: ice melt far exceeds scientific predictions, polar species lose their habitats, polar bears and penguins face extinction, and the polar ecosystem collapses entirely. The fragmentation of polar space symbolizes the breakdown of the Earth's ecological core balance, offering a direct warning of the Anthropocene climate crisis.

Wilderness space represents the pristine realm of natural ecology and the target of human plunder and destruction. Covering forests, grasslands, rivers and other natural forms, wilderness is essential for the self-repair of natural ecology. In the Anthropocene, wilderness has become a victim of industrialization and urbanization: in pursuit of economic growth, humans clear forests, reclaim grasslands and pollute rivers on a large scale, destroying the ecological integrity of wilderness; droughts and wildfires caused by global warming further degrade wilderness ecology and drastically reduce biodiversity. Through the decline of wilderness, the novel criticizes humanity's predatory exploitation of pristine natural spaces and reveals the devastating impact of anthropocentrism on natural ecology.

Urban space is the core space of human activity and the origin of the climate crisis. As the concentrated embodiment of industrial civilization, cities are major sources of carbon emissions due to fossil fuel consumption, industrial exhaust and expanded transportation networks, serving as the core carrier of humanity's geological force in the Anthropocene. In the novel, global warming brings persistent extreme heat to cities, with summer temperatures exceeding human survival limits and residents facing heatstroke and disease; sea-level rise submerges coastal cities, collapses urban

infrastructure and triggers social unrest. The crisis in urban space directly points to the drawbacks of modern developmental models and demonstrates the disruptive impact of human activity on the climate system.

2.2. Social Space: Fragmentation and Imbalance of Ecological Justice

The Anthropocene climate crisis is not only a natural crisis but also a social one. The impacts of climate disasters show obvious class and geopolitical disparities in social space. Through the construction of social space, the novel exposes ecological injustice in the Anthropocene.

From the perspective of class space, the costs of the climate crisis are borne by the underprivileged, while privileged groups evade ecological disasters through resources and power. In the novel, the wealthy live in upscale communities with sophisticated temperature control and ecological protection facilities, enjoying clean air, water and food while ignoring the survival plight of the poor. The underprivileged reside in crowded, dilapidated slums without basic ecological protection, becoming direct victims of extreme weather and disease outbreaks. This division of class space essentially reflects unfair distribution of ecological resources and the absence of ecological justice under capitalist logic. Through contrasting class spaces, Robinson criticizes the capitalist system's violation of ecological justice and argues that the climate crisis is not only an environmental issue but also one of social equity.

From the perspective of geopolitical space, huge disparities exist in climate vulnerability between developed and developing countries, and between coastal and inland regions. As pioneers of industrialization and major carbon emitters, developed countries shift the climate crisis through technological and economic advantages. Developing countries and low-lying coastal regions, with far lower total emissions, suffer the most from glacial melt, sea-level rise and extreme weather, facing the destruction of their homelands. Through ecological disparities across geopolitical spaces, the novel reveals geopolitical games in global climate governance, criticizes developed countries' failure to assume responsibility, and advocates global cooperation based on ecological justice.

2.3. Mental Space: Awakening and Reconstruction of Ecological Consciousness

Space exists not only as physical and social reality but also as a carrier of spirit and cognition. The novel's mental space focuses on the transformation of human ecological consciousness amid the climate crisis, shifting from anthropocentric paranoia to a symbiotic awareness of the ecological community, thus accomplishing the ecological reconstruction of mental space.

In the early stages of the climate crisis, human mental space is dominated by anthropocentrism. Some scientists, politicians and capitalists still uphold the idea of

"human conquest of nature", ignore warnings from climate science, pursue economic interests and power desires, and treat nature as an inexhaustible resource base. Such cognitive bias further exacerbates the climate crisis. As disasters intensify, existential hardship forces an awakening of mental space: scientists abandon utilitarian research and focus on scientific solutions for climate governance; ordinary people transcend class and regional divisions to form a community against the climate crisis; social elites begin to reflect on modern developmental models and reject anthropocentric thinking.

The construction of mental space in the novel is essentially a reconstruction of ecological values. Through the spiritual transformation of characters, Robinson indicates that the root of the Anthropocene ecological crisis lies in cognitive bias. Only by discarding anthropocentrism at the spiritual level and establishing the ecological ideal of "harmonious coexistence between humans and nature" can the climate crisis be truly resolved. This ecological awakening in mental space lays the core tone for the novel's ecological reflection.

3. Temporal Construction of Climate Narration in *The Long Summer*

Time constitutes another core dimension of ecological narration. The climate crisis is a persistent crisis spanning the past, present and future. Through multi-dimensional arrangements of linear time, compressed time and cyclical time, the novel breaks the temporal logic of traditional fiction, integrating the historical roots, real predicaments and future risks of the Anthropocene climate crisis to achieve a highly impactful narrative effect.

3.1. Linear Time: Ecological Interconnection of History, Reality and the Future

The novel adopts a linear narrative framework, tracing the formation of the Anthropocene climate crisis along a past-present-future timeline and revealing the causal relationship between human activity and the climate crisis.

Past time traces the historical origins of the climate crisis. Through memories and scientific records, the novel reviews human development since the Industrial Revolution: large-scale fossil fuel use, rapid industrialization and unrestrained ecological destruction constitute the fundamental causes of rising carbon emissions and global warming. Robinson traces the climate crisis to modern developmental models, arguing that the ecological predicaments of the Anthropocene are not accidental but historically inevitable due to long-term human plunder of nature, criticizing humanity's historical negligence of ecological laws and pursuit of short-term gains.

Present time presents the reality of the climate crisis. The core narrative centers on the contemporary moment, depicting human survival under global warming:

frequent extreme heat, collapsed agricultural production, social unrest and environmental degradation turn the abstract scientific prediction of the Anthropocene climate crisis into concrete existential disaster. Narration of the present allows readers to intuitively feel the urgency of the climate crisis, dispels the misconception that "the climate crisis is a future problem", and highlights the novel's real-world concern.

Future time provides risk warnings for the climate crisis. Based on climate science projections, the novel depicts a future of runaway climate crisis: coastal cities submerged by rising seas, total ecosystem collapse and the threat of human extinction. Future narration is not mere disaster sensationalism but rational scientific warning, reminding humanity that failure to change development models and curb warming will lead to catastrophic consequences. Meanwhile, the novel plants seeds of hope in the future, showing the possibility of human escape from crisis through scientific exploration, social transformation and ecological cooperation, offering direction for ecological redemption in the Anthropocene.

The linear temporal logic forms a complete narrative chain of historical tracing-realistic critique-future warning, clearly presenting the causality and evolutionary logic of the Anthropocene climate crisis and unifying literary narration with scientific rationality.

3.2. Compressed Time: Acceleration and Urgency of Climate Disasters

To heighten the urgency of the climate crisis, the novel employs a narrative strategy of compressed time, condensing long, slow climatic evolution into short, rapid disaster outbreaks, breaking the slow rhythm of natural time and creating a highly impactful effect.

Natural ecological change is gradual: glacial melt and global warming unfold over centuries. Yet the novel compresses this long process into decades or even years: global temperatures rise rapidly in a short period, polar ice shelves collapse on a large scale within years, and extreme weather shifts from once-in-a-century events to annual occurrences. This temporal compression is not unscientific but an artistic literary device, designed to amplify the urgency of the climate crisis and break humanity's procrastination and fluke mentality.

Under compressed time, the climate crisis is no longer a distant future problem but an existential emergency requiring immediate action. Robinson uses this strategy to awaken readers' ecological awareness, emphasize the urgency of Anthropocene climate governance, and criticize societal indifference and delay toward the ecological crisis.

3.3. Cyclical Time: Conflict Between Natural Rhythms and Human Time

Cyclical time represents the core temporal rhythm of natural ecology: seasonal shifts, diurnal cycles and ecological evolution follow natural circular laws. Human time, by

contrast, is linear and utilitarian, centered on economic growth and technological progress, pursuing infinite expansion and rapid profit. Through the conflict between cyclical time and human time, the novel reveals the essential contradiction of the Anthropocene ecological crisis.

In the novel, natural cyclical time is disrupted by human time: global warming distorts seasonal rhythms, summers extend indefinitely into a "long summer", crop growth cycles are broken and agricultural production collapses; the cyclical rhythm of biological reproduction is disturbed, species extinction far outpaces natural evolution, and the cyclical balance of the ecosystem collapses entirely. In pursuit of linear economic growth, humans ignore natural cyclical rhythms and replace natural time with human time, eventually triggering the backlash of the climate crisis.

Through narration of cyclical time, Robinson advocates the realignment of human time with natural rhythms, arguing that humanity must respect the circular laws of natural ecology, abandon utilitarian temporal perceptions of infinite growth, and achieve harmony between human development and natural rhythms. This temporal narrative embodies profound ecological wisdom and constitutes a core reflection on Anthropocene development models.

4. Ecological Reflections and Value Orientations Behind Spatiotemporal Narration

The spatiotemporal construction in *The Long Summer* is not merely formal innovation but carries profound ecological critique and value reconstruction. Through spatiotemporal narration, the novel criticizes anthropocentrism, capitalist logic and ecological injustice in the Anthropocene, advocates the ecological community, ecological justice and scientific redemption, and forms a complete system of ecological values.

4.1. Critique: Ultimate Reflection on Anthropocentrism

The core critical target of the novel's spatiotemporal narration is anthropocentrism. The fragmentation of natural ecology in physical space, the breakdown of ecological justice in social space, and the disruption of natural rhythms by human time in temporal narration are all consequences of anthropocentrism.

Within Western modernity, humans regard themselves as masters of nature, uphold "human supremacy", treat nature as a tool for conquest and exploitation, and ignore its intrinsic value and survival rights. This anthropocentric mindset leads to unrestrained plunder of natural resources and destruction of ecological balance, ultimately triggering the Anthropocene climate crisis. Through intertwined spatiotemporal disaster scenes, the novel profoundly criticizes the absurdity and harm of anthropocentrism, arguing that humans are not masters of nature but part of it, and that harm to nature will eventually backfire on humanity.

Robinson's critique does not reject human survival and development, but opposes

extreme anthropocentrism at the cost of nature, calling for a redefinition of the human-nature relationship as the foundation of the novel's ecological reflection.

4.2. Reconstruction: The Value of the Ecological Community

Facing the ecological predicaments of the Anthropocene, the novel reconstructs the value of the ecological community through spatiotemporal narration. The interconnectedness of global ecology in physical space, cross-class and cross-regional cooperation in social space, and intergenerational responsibility across past-present-future in temporal space together construct an ecological community of "symbiosis between humans and nature, mutual aid among people".

The ecological community breaks the individualistic and utilitarian cognition of anthropocentrism, emphasizing that the Earth's ecology is an organic whole in which humans and all natural beings are interdependent. The climate crisis is a shared challenge for all humanity, from which no individual, class or nation can insulate itself. In the novel, scientists, ordinary people and social elites transcend divisions to form a cooperative community for climate governance, embodying the ecological community in concrete form.

Through the value reconstruction of the ecological community, Robinson points out that the solution to the Anthropocene climate crisis lies in abandoning selfish individual and national mentalities, establishing global ecological awareness, and addressing ecological challenges through collective power, providing value guidance for contemporary global climate governance.

4.3. Persistence: The Core Pursuit of Ecological Justice

Ecological justice is the central value pursuit of the novel's spatiotemporal narration. Through ecological fragmentation in social space and justice imbalance in geopolitical space, the novel criticizes ecological injustice under capitalist logic and geopolitics, advocating ecological justice that unifies intragenerational and intergenerational justice.

Intragenerational justice emphasizes ecological equity among contemporary humans, opposing the shifting of the climate crisis from developed to developing countries and from privileged classes to the underprivileged, and demanding fair distribution of ecological resources and responsibilities. Intergenerational justice stresses ecological fairness between present and future generations: the present must not overdraw future survival resources and should leave a sustainably viable environment for descendants. In the novel, the core goal of climate governance is to achieve ecological justice, ensuring that all humans, regardless of class, region or era, equally enjoy a healthy ecological environment and bear corresponding ecological responsibilities.

The integration of ecological justice elevates the novel's ecological reflection beyond mere nature conservation to the heights of social equity and human responsibility,

demonstrating the humanistic concern of ecological literature.

4.4. Exploration: A Redemptive Path Integrating Science and Humanism

The Long Summer is not a pessimistic disaster novel but a hopeful work of ecological redemption. Through spatiotemporal narration, it explores a redemptive path for the Anthropocene climate crisis — the integration of scientific spirit and humanistic concern.

Based on rigorous scientific narration, Robinson emphasizes that climate governance must respect climate science and rely on technology to reduce emissions and restore ecology, rejecting anti-scientific ignorance. At the same time, the novel argues that technology is not panacea and must be guided by humanism, freed from capitalist capture, and directed toward ecological justice and human well-being. The scientists in the novel combine superb scientific expertise with deep care for humanity and nature, providing technical support for ecological redemption and spiritual cohesion for climate governance.

The integration of science and humanism constitutes Robinson's core solution to the ecological dilemmas of the Anthropocene, reflecting commitment to scientific rationality and pursuit of humanistic value, endowing the novel's ecological reflection with both rational depth and human warmth.

5. Contemporary Value and Implications of Climate Narration in *The Long Summer*

5.1. Artistic Implications for Climate Fiction Writing

The spatiotemporal narration of *The Long Summer* offers important artistic references for contemporary climate fiction. First, uphold the unity of scientificity and literariness: climate fiction should be grounded in ecological science, reject unrealistic fantasy, and enhance narrative persuasiveness through precise scientific details. Second, strengthen the ecological function of spatiotemporal narration: treat spatiotemporal construction as a core carrier of ecological critique and value transmission, and present the systemic nature of the climate crisis through diverse spatiotemporal forms. Third, integrate real-world concern and future warning: confront contemporary climate issues while projecting scientific future risks, making climate fiction both practically meaningful and cautionary.

Robinson's creative practice has elevated climate fiction from niche literature to mainstream discourse, improved the artistic quality and ideological depth of ecological literature, and pointed the way for the development of contemporary ecological writing.

5.2. Practical Implications for Anthropocene Ecological Governance

The novel's ecological reflections provide significant practical guidance for

contemporary Anthropocene climate governance. First, abandon anthropocentric thinking, establish the ecological ideal of harmonious coexistence between humans and nature, and respect the intrinsic value and laws of natural ecology. Second, adhere to the principle of ecological justice, promote fairness in global climate governance, require developed countries to bear greater ecological responsibility, and protect the ecological rights of the underprivileged and developing countries. Third, strengthen global ecological cooperation: as a shared crisis, the climate crisis requires breaking geopolitical barriers and conducting global cooperation under the consciousness of the ecological community.

At a time when global climate governance faces severe obstacles, the novel's ecological ideals provide spiritual direction for real-world society, highlighting the practical value of ecological literature.

6. Conclusion

The arrival of the Anthropocene has made the climate crisis an unavoidable epochal issue for humanity. Centered on climate narration, Kim Stanley Robinson's *The Long Summer* achieves a literary portrayal of the Anthropocene's ecological predicaments through layered spatial construction and multi-dimensional temporal arrangement. Its physical space reveals the fragmentation of natural ecology; social space exposes the breakdown of ecological justice; mental space shows the awakening and reconstruction of ecological consciousness. Linear time clarifies the historical causality of the climate crisis; compressed time heightens the urgency of ecological danger; cyclical time reflects on the rhythmic conflict between humanity and nature.

The novel's spatiotemporal narration is far more than formal innovation: it carries profound ecological reflections, criticizing extreme anthropocentrism through intertwined disaster scenes, reconstructing the human-nature relationship via the ecological community, upholding social fairness through the pursuit of ecological justice, and exploring ecological redemption through the integration of science and humanism. *The Long Summer* is not only a classic of contemporary climate fiction but also a literary model of Anthropocene ecological reflection. Its unique spatiotemporal art and profound ecological values enrich the theoretical study of ecological narratology and provide spiritual guidance for contemporary global climate governance.

As the climate crisis intensifies, the mission of ecological literature grows increasingly important. *The Long Summer* shows that the ecological predicaments of the Anthropocene are not insoluble. As long as humanity abandons anthropocentric paranoia, embraces the ecological community, upholds ecological justice, and protects nature through science and humanism, hope for ecological redemption can be found amid the "long summer", and harmonious coexistence between humans and nature, and among humans themselves, can be achieved.

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