



Gene-Edited Life, Technocapitalist Violence, and Ethical Collapse: Posthuman Predicaments in Paolo Bacigalupi's *The Windup Girl*

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Abstract

Paolo Bacigalupi's science fiction The Windup Girl critiques technocapitalist violence through genetically modified life forms—Cheshire Cats, Megodonts, and the Windup girl Emiko—whose suffering embodies the ethical collapse and demonstrating from three forms: cyborg terror, loss of life rights and technological alienation. The Cheshire Cat's cyborg image shatters illusion and reality, creating a cognitive dissonance for humans struggling to survive in a post-apocalyptic world and disrupting the balance of the native ecological order. Their image parodies Haraway's emancipatory cyborg ideal, instead becoming tools of capital-driven ecological violence. Megodonts are physiologically altered to suit human preferences and thus become animal slaves who provide energy and productivity, losing their autonomous lives, their right to exist and their identity as moral subjects. Emiko, a windup girl designed for servitude, becomes a sexualized spectacle, her body reflecting instrumental rationality as blind technology progress erodes humanity and new species agency. Bacigalupi urges a return to a sustainable technological ecology and a positive mind to interact with multiple otherness, emphasizing posthuman ethical deliberation and interspecies communication to avert dystopian collapse.

I. INTRODUCTION

Paolo Bacigalupi, an outstanding representative of contemporary American science fiction literature, released his first full-length science fiction novel, *The Windup Girl*, in 2009. The novel won the Hugo and Nebula Awards, the highest honors in science fiction literature, which possesses abundant academic research value. Through its panoramic depiction of a futuristic, apocalyptic city, *The Windup Girl* delves into a picture of humanity's quest for an existential future with a new genetically modified species. After the exhaustion of oil energy, the global sea level rises, natural disasters are frequent, and mutated viruses such as scabies, blister rust, and pincer spurs caused by the proliferation of technology create an apocalyptic dystopia. In this ecological wasteland, Bangkok, Thailand, is the only remaining "sanctuary" in the novel, but it is no longer a traditional human city. Transnational capital and technology giants have used biotechnology to reshape the city into an ethically alienated space of genetically modified animals, artificial life forms, and technological capital.

In the novel, Bacigalupi delicately depicts the biodiversity of the post-human era as a result of technological modifications. The coexistence of genetically modified organisms (GMOs) such as Megodonts, Cheshire Cats, Windup girls, and ivory beetles with human beings, as well as the conflicts they trigger, is vividly portrayed. These genetically modified lives are not only products of technological intervention in nature, but also symbols of the reshaping of the relationship between humans and nature in the post-human era. The ethical dilemmas and social challenges encountered in the coexistence of genetically

modified species with human beings are real issues that need to be addressed urgently in the new era. When gene editing technology blurs the boundaries of species and traditional anthropocentrism is subverted, the conflict between technological rationality and the dignity of life becomes one of the unavoidable potential diseases of modern civilization.

Scholars at home and abroad have made interpretations of this novel in terms of ecocriticism and post-humanity. Zhang Yuan (2023) focuses on the influential relationship between the material body and soul meanings of the windup girl Emiko in this novel as it interacts with the ecosystem, "the intermingling of Emiko's body and soul tells the story of its role as an energetic subject, which occupies an ecological position in the biosphere and is interconnected with the individual substances in the ecological network." (Zhang, 2023) Analyzed through the lens of a posthumanist Anthropocene, Xu Zixian (2022) argues that the windup girl Emiko achieves a process of reconfiguration from the mastery of a technological body to that of a nomadic subject that develops in fusion with the world. Tom Idema (2020) cuts through the perspective of the flood disaster and holds that the novel's narrative strategy of water as a medium provides an alternative to the traditional terrestrial narrative perspective in ecocriticism. Heather Sullivan (2022) also focuses on genetically modified plants, and she argues that the relationship between humans and plants presents a dark green bond that is certainly the current state of human culture. The pure green color of nature has been turned into a darker green due to the contamination of chemicals

such as pesticides. The relationship between humans and plants has also gradually alienated. While domestic and foreign studies of the novel have focused on ecological and posthumanist studies, few scholars have paid attention to the ethical predicaments genetically modified life suffers in the novel.

Therefore, this article aims to analyze the three major existential dilemmas faced by genetically modified organisms in *The Windup Girl* - the horrific experience of Cyborg's existence, the loss of life autonomy and the collapse of ethical order with the analytical framework of posthumanism theory, incorporating the technological criticism. It also tries to reveal the intrinsic connection between the formation mechanism of these dilemmas and the logic of techno-capitalism.

II. CRITICAL PERSPECTIVES: POSTHUMANISM AND TECHNOLOGICAL CRITICISM

From gene editing, artificial intelligence and other cutting-edge technologies to artificial organs and other technological equipment that are closely linked to the organisms and even to the human body, human beings no longer exist independently, but rather, they are showing a tendency to mix and mingle with technology and organisms in a multifaceted way. In the age of technology, the subjectivity of human existence is challenged by the integration of technology, and the age of anthropocentrism is coming to an end. Posthumanist scholar Donna Haraway (1985) has proposed the subversive concept of "Cyborgs", which profoundly challenges the anthropocentric composition of binary hierarchical identities. While the

anthropocentric narrative is facing transformation, the interaction between human beings and the natural environment has been reinterpreted in terms of ecological ethics. As the global ecological crisis continues to highlight and ecocriticism flourishes, the study of animal ethics has become one of the core issues in the field of environmental ethics. Tom Regan's theory of animal ethics puts human beings and animals on an equal moral footing by arguing for the moral rights of animals as "subject-of-a-life", emphasizing that animals possess inalienable intrinsic value rather than being resource objects in the sense of instrumental rationality. (Regan, 1983) Meanwhile, Technology is no longer seen simply as an extension or tool of the human limb, but as a medium for deeply intervening in the subject of life and reconfiguring the way of being of the human and the other. Philosophers from the Frankfurt School put forward the theory of the critique of instrumental reason regarding the challenges of the times and the dilemmas of individual survival brought about by technological development. According to it, the driving force behind the development of human civilization is objective rationality, which pursues social emancipation, freedom and truth. However, with the development of capitalism, objective rationality has gradually degenerated into "instrumental rationality", which only focuses on efficiency and goals.

Using posthumanist theory, animal ethics and the Frankfurt School's critique of technological rationality, this study examines Paolo Bacigalupi's *The Windup Girl* from an interdisciplinary perspective, aiming to reveal the novel's profound reflection on the ethical

evils incurred by anthropocentric hegemony in the world of genetic engineering. The novel's genetically modified organisms, such as the cyborg Cheshire Cats, Megodonts, and the windup life Emiko, are portrayed as marginal others subject to the exploitation of technology and power, whose existential predicament exposes the violent logic of techno-capitalism. The analysis of the three genetically technological organisms aims to highlight Bacigalupi's call for symbiosis and coexistence in a posthuman era, alert to the alienating ethics of technological abuse. In the era of endless new species, human beings should realize that they should re-examine themselves, deliberate the products of science and technology, rethink the relationship between human beings and non-human beings, and work hand in hand to build a common living space.

III. CHESHIRE CATS: CYBORG TERROR AND ECOLOGICAL DISRUPTION

In 1985, Donna Haraway defined her significant concept of "cyborg": it is "a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction" (Haraway, 1985) which showed the ambiguity existed in species. The essence of the cyborg lies in its mixture of heterogeneity, a mixture that makes subjectivity complex and diversified. The essence of Haraway's emphasis on heterogeneous identities is to dismantle anthropocentrism and break through the dualistic power structures of nature and culture, human and non-human.

In the novel, Bacigalupi creates a series of cyborg animal figures with a high degree of fusion between technology and organism, the

most representative of which is the Cheshire Cat. However, the image of the Cheshire Cat makes a bold attempt at an experimental inversion of Haraway's theory. The intermingled heterogeneous creature loses its pioneering quality of challenging binary hierarchies and becomes a slave to the power of manifest technocapitalism. The Cheshire Cat is born from the peculiar vision of a capitalist magnate. He hopes to use gene-editing technology to fulfill his daughter's dream of the fantastical creatures from Alice in Wonderland. Through gene-editing technology, the capital giant company PurCal or AgriGen has modified the cat's genetic chain, and the Cheshire Cats become a ubiquitous presence on the streets of Bangkok in a post-apocalyptic setting. The birth of the Cheshire Cat is an extension of the capitalist patriarchy's use of gene editing to satisfy its desires.

The appearance of these Cheshire Cats is still the typical image of a domestic cat, but their bodies are able to adapt according to the external environment, realizing the visual effects of invisibility and flickering. "The devil cats flicker closer. Calico and ginger, black as night—all of them fading in and out of view as their bodies take on the colors of their surroundings." (Bacigalupi, 2009) The cyborg Cheshire Cats not only break through the boundaries between genetic technology and organisms, but also challenge the boundaries of human cognition, dissolving the divide between fairy tales and the real world, and blurring the boundaries between the fantastical and the real.

The cyborgs created by gene editing technology in heterogeneous fusion forms constitute a strong impact on human cognition,

subverting the traditional human understanding of life forms and also triggering a deep sense of subjective discomfort. “The old man’s flinch is as hallucinogenic as a cheshire’s fade—one moment there, the next gone and doubted” (Bacigalupi, 2009) It can be seen that in the collective consciousness of humanity, the Cheshire Cat has transformed into a metaphorical cultural symbol. It is akin to the hearts of people in an apocalyptic scenario, who are self-serving, full of scheming, and elusive, evoking deep-seated distrust and fear within people. The psychological fear generated by the Cheshire Cat’s cyborg image, which blends reality and illusion, is precisely the tragic portrayal of humanity’s helplessness and confusion when facing the uncontrollable development of artificial creations. “The web woven by science and technology is, to a certain extent, oppressive and repressive to the human heart, human nature, and human life.” (Wu, 2007) This paradoxical heterogeneous fusion of cognition triggers an abrupt and bizarre sense of fear, exacerbating the unknown panic of subjectivity and cross-species cognition in the post-human era. From a symbol of liberation that subverts binary oppositions and solidified hierarchies, cyborg has been alienated by the manipulation of technocapitalism to become a source of spreading fear.

The Cheshire Cat, a cyborg incarnation of the fusion of technology and biology, has gained the ability to adapt to harsh environments through genetic editing. However, this genetic modification also deprived it of natural enemies in the natural ecosystem, which led to its uncontrolled reproduction. Cyborgs have squeezed out the natural domestic cat and

caused the sad consequence of its extinction. “The devil cats were on every continent and *Felis domesticus* was gone from the face of the world, replaced by a genetic string that bred true ninety-eight percent of the time.” (Bacigalupi, 2009). Gene-editing traits give the Cheshire Cat an advantage in adapting to harsh environments, but the Cheshire Cat’s species thrives at the expense of overall ecosystem health.

Bacigalupi portrays the cyborg image with a strong gothic aesthetic, exposing the catastrophe that follows technological disorder. In resource-poor Bangkok, cyborg Cheshire Cats are found in all corners of the city, and in order to survive, they have to feed on garbage and rotting corpses. “They shade red as they dip into the blood pool.” (Bacigalupi, 2009) This survival instinct has led them to be attracted to the smell of blood and to frequent death scenes, sparking rumors in human society that “the cheshire trickster spirit has caused the calamity.” (Bacigalupi, 2009) “To grin like a Cheshire Cat” as an idiom in English refers to an unexplained or inexplicable laugh, which has a contemptuous smile or expresses an enigmatic sentimentality. The Cheshire Cat’s existence in this novel is closely linked to extinction and mysterious death, the romantic fantasies of fairy tales becoming bloody realities in a technologically hegemonic society. This experimental inversion projects the reality that constitutes an ominous omen and triggers deep panic for those humans who still seek hope and vitality of life in a post-apocalyptic scenario. From its birth to its disastrous spread, the Cheshire Cat maps the process of human beings utilizing technology to satisfy their selfish desires and gradually falling

out of control, a process that highlights the serious consequences of the proliferation of technology and the dissolution of ethics and morality. This fear of cyborgs is rooted in mankind's deep concern for the unknown risks brought about by the abuse of technology, as well as the deep concern for human interference in the natural order.

IV. MEGODONTS: GENETIC MODIFICATION AND LIFE SLAVERY

In *The Windup Girl*, genetic oligarchs have genetically modified elephants to enhance their physiological functions in order to meet the urgent need for labour. Humans used genetic technology to awaken the genes of prehistoric mammoths, fusing the genes of the mammoths with those of in elephants. The genetically modified giant elephants created have four tusks and a muscular body weighing more than ten tonnes making them better able to adapt to intense labour environments. This genetic modification not only changes the physiology of the animals, but also deprives them of their autonomy and dignity as subjects of life. "The megodont is up on its hind legs, swaying. The beast's four tusks have been sawn off for safety, but it is still a monster, fifteen feet at the shoulder, ten tons of muscle and rage, balanced on its hind legs. It pulls against the chains that bind it to the winding spindle. Its trunk lifts, exposing a cavernous maw." (Bacigalupi, 2009)

Tom Regan's theory of animal rights proposes that all living subjects have experiential well-being, i.e. they are capable of experiencing pleasure and pain, and on the basis of this experience they autonomously satisfy their desires and fulfil their goals. (Zhang, 2020)

Regan argues that although animals may not possess moral subjectivity, they also possess inherent value as living subjects. This inherent value means that the basic welfare and rights of each individual should be respected. On this basis, the inherent value of animals should not be ignored or violated, and their very existence deserves to be treated equally, whether or not they are capable of moral judgement. The genetic modification of megodonts goes beyond the natural evolutionary logic of animals adapting to their environment through their own survival needs, and has instead been subjectively modified against the animal's will based on human needs.

The mammoth's thick woolly coat, which was originally a key physiological adaptive mechanism evolved during the glacial period to protect it from the cold, was artificially implanted into Thai giant elephants living in a subtropical climate. In the high temperatures and humidity of the subtropics, this fleece may be a burden on the elephant's ability to dissipate heat, but for humans the fur is a high-priced product sold on the black market. Ivory, as a natural defence for elephants and an important biological trait used in the natural selection process for courtship, should be a key feature for their survival and reproduction. But in order to satisfy the human desire for illicit trafficking, these modified megodonts have been given four huge tusks, far beyond what they actually need for defence and courtship in their natural environment. This kind of modification forces animals out of their natural evolutionary path and turns them into tools to satisfy human desires, a kind of anthropocentric arrogance and ecstasy. Through gene editing, the giant elephant's body structure

has been modified to satisfy human demand for its value, yet this result has deprived the elephants of the ability to perceive their own desires and biological habits, further deprived them of the right to pursue pleasure and happiness, and even more essentially weakened their intrinsic value and autonomy as subjects of life.

In the post-apocalyptic context, global energy resources are facing depletion, and the scarcity of traditional energy sources has prompted mankind to seek alternatives. In this scenario, the torsion spring, an industrial product capable of providing energy to operate, becomes the key to keeping society running. Megodonts have been modified and used by genetic companies to produce torsion springs, thus becoming a source of bioenergy. "The genehacked animals comprise the living heart of the factory's drive system, providing energy for conveyor lines and venting fans and manufacturing machinery." (Bacigalupi, 2009) The novel opens with a tragic depiction of giant elephants forced to labour in the SpringLife factory, imprisoned in a harsh working conditions and forced to undertake onerous tasks beyond their natural capacity. "Kinetic power sparks through the system like adrenaline, a tingling anticipation of the energy about to pour into the manufacturing line. A megodont screams protest and is lashed into silence." (Bacigalupi, 2009) However, as mankind's demand for energy continues to rise, so does the need for giant elephant labour. Employees at the SpringLife Factory have to rely on violence in order to drive the elephants to work harder. Through constant whipping and reprimanding, they instilled a deep fear of

human violence in the elephants. This fear became the only motivation for the elephants to work harder. Such behaviour not only deprives the elephant of its dignity and autonomy as a living creature, but also reflects the serious neglect of the rights and interests of animals in the pursuit of energy and productivity.

In the narrative, Anderson's spring factory reduces the megodonts, to mere production instruments. Kant's attitude towards animals, however, is this kind of indirect obligation, and he believes that humans do not possess any moral responsibility towards animals. "Animals are not self-conscious and are there merely as a means to an end. That end is man....." (Kant, 1963) When these elephants succumb to the strain of their arduous labor and exhibit signs of getting delirious, the factory staff, driven solely by the imperatives of maintaining production efficiency and mitigating losses, resort to the use of wasp venom to swiftly terminate the monster's live. "The monster settles back on its haunches, looking ridiculously like a dog. Its expression is almost puzzled, a drugged surprise that its body no longer obeys." (Bacigalupi, 2009) The megodont, subjected to the relentless pressures of human-imposed labor, attempts to rebel. Yet, this act of defiance serves as a prelude to their demise. The elephant's fate, including the timing and circumstances of their death, is predetermined by human genetic edit technology. In a state of disorientation and impotence, they are relegated to the status of obsolete tools, inexorably marching towards their preordained end. Even the dead bodies of the poor giant elephant is coveted by humans to extract the last energy value. "Hock Seng watches sourly as blood flows past. The beast

held gallons of it. Untold calories rushing away.” (Bacigalupi, 2009) However, what is even more alarming is that the loss of animal rights signifies the precariousness of the human moral framework. When humans display such an indifferent attitude and a lack of empathy towards living animals, it indicates that their moral framework is incomplete. This incomplete moral framework will inevitably extend to their indifference towards human companions, thereby threatening social stability.

From the perspective of animal ethics, indifference to animals not only reflects the moral deficiency of human society but also reveals the alienation of human social concepts in the apocalyptic environment of technological overabundance, leading to the expansion of loopholes in social moral norms. If this loophole is not repaired, it may lead to further regression of social civilization, which is what Bacigalupi attempts to alarm in his novel. Therefore, human should realize that “we have the same moral obligations to moral patients of animals who are capable of sensing pain and suffering harm”. (Wang, 2017)

V. EMIKO: BODY ALIENATION AND DESIRE SPECTACLE UNDER TECHNOLOGICAL CONTROL

The path of the windup girl Emiko’s survival in the post-apocalyptic world is an implicit reflection on the ethical dilemma of technological alienation and the existence of a new species. The windup girl represented by Emiko is a new species created by a Japanese company after editing specific genes to serve humanity by using human genes as a blueprint. As a functional tool of technological rationality, windup girl is

categorized into military and secretarial types, providing specialized services for human beings.

The instrumental rationality critique of the Frankfurt School argues that the progress of science and technology has opened up resources for mankind and materialized man’s dream of conquering nature step by step, but has forced mankind to face the antagonism of technological progress. While dominating the top of capital, social interests, and natural resources through the promotion of productivity and the spirit of rationality, human beings have neglected the fact that the blind development of technology will lead the progressive civilization to barbarism. The value of the living individual is dwarfed in the system of measurement of technological control and productivity. Emiko was originally a man-made genetic product positioned as an “elegant secretary”, and her physical structure was specifically modified by genetic technology. This violent genetic modification is essentially the degradation of the human organism into quantifiable and programmable data, and the vital signs of human beings, such as breathing, sweat, and body temperature, are transformed into monitorable data streams to satisfy the needs of human beings. Her skin is “So small. So delicate. So optimal. But made for Nippon and a rich man’s climate control.” (Bacigalupi, 2009) Humans view the windup girl’s life-existence through an instrumental view, applying targeted genetic modifications to his body to emphasize his external beauty and sophistication. Beauty no longer stems from the spontaneous power of life, but has become the consumption of desires predetermined by capital.

Horkheimer argues that the desire for social wealth and capital accumulation has led to the

alienation of human beings, the loss of humanism, and their degeneration into profit-seeking machines. Emiko's experience further illustrates a double loss under technical discipline: the loss of the sanctity of life and the loss of the brilliance of humanity. Emiko's encounter with the abandoned Bangkok constitutes a cruel metaphor for the broken promise of instrumental rationality. In the midst of a post-apocalyptic escapade, the original Japanese owner, Gendo-sama, was so busy fleeing for his life that he abandoned Emiko in the humid and hot Bangkok, Thailand. Due to the fine sweat glands and delicate pores of the windup girl's modifications, it was difficult to survive in the hot and humid subtropical climate due to the difficulty of sweating. As a result, Emiko had to engage in bar pornographic performance services to earn ice for herself in exchange for survival. Genetic modification, which was meant to demonstrate technological superiority, has become a shackle that stifles the right of a new species to survive in a post-apocalyptic world.

The purpose of instrumental rationality is to stop pursuing the rationality of the process and to emphasize only practicality and benefits. In this process, science and technology, as the intermediate productive forces that drive social development, have gradually dissolved the human spirit of reflection and criticism in the pursuit of benefits and the satisfaction of human needs. In the process, her value falls even further, from a service-oriented secretary to a sex toy in bar. "She is nothing but a silly marionette creature now, all stutter-stop motion—herky-jerky heechy-keechy." (Bacigalupi, 2009) In the carnival of

technological mastery, Emiko is alienated as a mere object to satisfy human needs, and mankind is caught in an ethical whirlpool, forgetting to respect the pluralistic value of life. Moreover in the purgatory of the bar's pornographic performances, the "vanguard of some new Expansion" survey Emiko with lustful gazes, gaining the pleasure of dominating artificial beings by scrutinizing her agonies and screams of sexual violence, and by observing her uncharacteristic jerky movements. This gaze itself not only is simply regarded as a pornographic consumption, but also becomes a micro-practice of the "carnival of instrumental rationality" criticized by Horkheimer. "Both static ontology and the doctrine of progress—both objectivistic and subjectivistic forms of philosophy—forget man." (Horkheimer, 2004) By visualizing pain as a consumable performance, techno-capitalism accomplishes a systematic paralysis of ethical perception. "She cries out. Arches. Her body performs just as it was designed—just as the scientists with their test tubes intended." (Bacigalupi, 2009) Emiko's uncontrolled physiological response in the pornographic performance is the technological cage created for her by the scientists, and gene editing makes the windup girl biologically victimized by the system of technological discipline. Human beings have castrated their ability to empathize with others through technological tyranny, attempting to evade reflection on their bioethical responsibilities. In this way, the brilliance of humanity has been completely lost.

Horkheimer's philosophy of technology criticizes the objectification of Emiko's body by technology and further demonstrates the

discipline of technology. Marcuse (2002) further reveals a deeper ethical crisis: the adverse effects of physical discipline have already spread to the construction of Emiko's subject identity. Humans with technological capital believe that the windup girl only needs to provide services and obey instructions, and does not need to raise any questions. They "seek to obey. To have others direct us. It is a necessity. As important as water for a fish. It is the water we swim in." (Bacigalupi, 2009) After being reduced to a sex toy in a Bangkok porno bar, Emiko's obedient nature compels her to find her next master and complete the windup man's program of attachment to humans as a tool. Therefore, when Anderson interrogates Emiko for information, his majestic eyes and deep, serious tone of voice constitute a kind of controlling power oppression, which awakens the obedience mechanism in Emiko's genetic coding, making her unconsciously want to please him, and gain a long-lost sense of security by obeying his instructions. "The air of authority is palpable, and strangely comforting" (Bacigalupi, 2009) Marcuse points out that the technological age dissolves individual freedom and true judgment by creating false needs. These false needs are often oppressive and aggressive. Even though there is pleasure to be gained from fulfilling them, the ultimate goal is to perpetuate the oppression and discipline of the individual. Because in the eyes of Anderson and other humans who hold capital and social power, Emiko is just a novelty object to be exhibited and traded for power and sex. Emiko's choice to submit under oppression realizes that technological hegemony kills the possibility of resistance by internalizing oppression as an individual's need, ultimately reducing lives to

"products of a society whose dominant interest demands repression." (Marcuse, 2002)

When mankind utilizes technology to crudely restrict the right to life to genetic coding, it has already degenerated into the nihility of the existence of human life in the midst of instrumental ecstasy. The audience's frenzied consumption of Emiko's pornographic performance in the bar is essentially the result of the complicity between capital and technology, but they have already immersed themselves in the transient excitement, oblivious to it. This unidimensional technological hegemony is essentially a deep alienation of the humanity value, revealing both a blind superstition in the technological power and a disdain for the subjectivity of the life of the new species. By simply replacing ethical issues with pure sensual stimulation, techno-capitalism succeeds in dissolving critical thinking. With this tiny theater of humanity, Bacigalupi reveals a frightening but cautionary conjecture: "in such a society, the generative dimension of human beings and the common dimension of value understanding are bound to suffer a setback." (Xue, 2024)

VI. CONCLUSION

In *The Windup Girl*, Bacigalupi constructs a dystopian mirror reflecting the catastrophic consequences of unchecked technological rationality under capitalist hegemony. In the novel, genetically modified animals face various types of survival predicaments.

The Cheshire Cat's ontological ambiguity, as a cyborg hybrid of organic and technological elements, epitomizes Donna Haraway's conceptualization of boundary dissolution in

posthuman ecosystems. The cyborg Cheshire Cats, once created by humans, are coerced into becoming demons that disseminate cognitive terror, coupled with a deep-seated anxiety about human disruption of the natural order. The apprehension towards cyborgs stems from humanity's profound unease that arise from the misuse of technology, embodying Donna Haraway's subverted cyborg theory where boundary dissolution fuels techno-terror.

Meanwhile, the Megodonts' plight exposes the violence of anthropocentric utilitarianism. Tom Regan once said: "Whenever we find ourselves in a situation where all of the options at hand will produce some harm to those who are innocent, we must choose that option that will result in the least total sum of harm." (Tom, 1983) Megodonts are sexually altered to suit human preferences and thus become animal slaves who provide energy and productivity, losing their autonomous lives, their right to exist and their identity as moral subjects. "It is just an ill-used creature. The monster was never destined for fighting." (Bacigalupi, 2009) Stripped of autonomy and subjected to genetic modifications that prioritize human labor demands over biological integrity, these creatures embody Tom Regan's concern that inherent value transcends anthropocentric utilitarian calculus.

Emiko's narrative arc further amplifies ontological critiques of humanity's hubris in manipulating life through instrumental logic. As a windup girl designed for servitude, her body—a site of genetic precision and capitalist desire—becomes a metaphor for instrumental rationality. Its suffering serves as an illustration of how the mastery of technology can lead to the

dissolution of a new species' life and its subjectivity, owing to their inherent plurality. The sexual violence and the dehumanizing conditions under which the windup girl lived sheds light on the issue of humanity's descent into ethical barbarism, a process characterized by the erosion of the capacity for critical reflection due to the predominance of instrumental logic.

In sum, the portrayal of genetically modified organisms in Bacigalupi's novels functions as a cautionary tale for post-apocalyptic allegorical imagery. This anthropocentric overdevelopment, coupled with the proliferation of technology, has not only led to human psychological discomfort and ecological chaos, but also triggered social and moral disorders. Bacigalupi suggests "a generative cross-species flux of open, interconnected, multiple genders" through interactions with multiple others through conceiving a sci-fi dystopia. (Liu, 2023) Human beings are prompted to reconceptualize interspecies relations in this posthuman era, where various challenges should be confronted with sustainable technological ecology.

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