

*“Do you think it is a Pandemic?” Apocalypse, Anxiety  
and the Environmental Grotesque in Paolo Bacigalupi’s  
The Windup Girl*

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**Abstract.** Paolo Bacigalupi’s *The Windup Girl* (2009), set in the post fossil-fuel, post turbo-capitalist country of Thailand, portrays the shocking after effects of bioengineering and gene-hack modifications in food crops. The narrative depicts a country tottering on the brink of an agricultural apocalypse on account of food production being severely affected by crop driven anomalies and rogue diseases such as “cibiscosis” and “blister rust” transmitted by variants of mutating pests. Natural seed stock becomes completely supplanted by the new genetically engineered seeds which become sterile after a single seasonal cycle of sowing and harvesting. The native population of Thailand is adversely affected by the pandemic scenario, which becomes aggravated by an expedient “scientocracy” that is at the heart of the neocolonial enterprises of American megacorporations and calorie companies like Agrigen, PurCal and Redstar who hail gene hacking as the new future of food resources and market profiteering. The consumption of the gene-hacked produce spreads through crops and affects the human body in unimaginable ways thereby resulting in a considerable rise of health issues including digestive and respiratory failures.

This paper intends to articulate the idea of a pandemic, its historical understanding and affective influences in the context of a post techno-fossil fuel economy set in Thailand. It will analyse the idea of epidemiological colonialism; diseases introduced by colonising forces that reshape the natives’ existing environment thereby bringing forth a deep pandemic anxiety that percolates the collective memory of the Thai people. It also highlights how the novel portrays the conflict between traditional ecological knowledge systems and modern extractive enterprises that acts as a catalyst to hasten the destruction of sustainable systems of agriculture and food production that have endured the impact of climate change and ecological fallout. The paper will study the relevance of the pandemic as an agency of ecocatastrophe and its function in an eco-speculative science fictional narrative. Finally, the paper looks into the concept of the posthuman android, genetically modified humans in a “technogiade”, a society reconfigured by technoscience to resist the impact of environmental collapse, and explores how this trope is incorporated in Bacigalupi’s narrative to celebrate human striving for hope and survival in

an imagined environmental future marked by a self-created agro-scientific grotesqueness.

**Keywords:** bioengineering; gene-hack; pandemic; posthuman; post-fossil fuel economy; agricultural apocalypse; anxiety; the environmental grotesque

Pandemics can be perceived as scenarios of change that are both unthinkable and incomprehensible to the regularities of existence. It can be described as a phenomenon of contested origins that has the potential to disorient and reconfigure human cognitive engagement with life. In his article titled “The Coronavirus is Rewriting Our Imaginations”, American science fiction writer Kim Stanley Robinson explains the abrupt and sudden occurrences in the course of a civilisation that reconfigures the perception of reality. He says, “What felt impossible has become thinkable. The spring of 2020 is suggestive of how much, and how quickly, we can change as a civilization” (Robinson 2020). Robinson’s argument about the swiftness with which the cognitive, imaginative and symbolic understanding of a civilisation change corresponds with the recent eruption of an epidemiological catalyst which has affected the way of the world. The outbreak of the Covid-19 virus is a major force that has challenged not just medical science but has also acted as a paradigm changer that has dealt a cognitive shock to the psycho-social given and the quotidian. Ecospeculative fiction can be considered perhaps the most appropriate genre that can encompass and complicate the idea of a pandemic and evolve a new mode of understanding in its spatio-material and temporal dimensions by envisioning it in a future world. Pandemics add an epidemiological perspective to the existing trajectories of SF narratives that employ the trope of the apocalypse. The material conditions of a pandemic that are often taken on surrealist dimensions reimagine the conditions of human existence in a dystopian plane by reiterating motifs of catastrophe and total fallout. Paolo Bacigalupi’s debut novel, *The Windup Girl* (2009), was regarded by *TIME* magazine as one of the top ten most influential novels written in 2009 in the genre of speculative science fiction. It won the prestigious Hugo and Nebula awards in 2010 and is also the recipient of the 2010 Locus award for best first novel. It portrays the vision of a post-apocalyptic future where the world has literally given in to the catastrophic forces of nature. Raging oceans and widespread pandemic has sucked entire civilisations into a vortex of existential crisis. The novel has its own “structure of feeling” (Robinson 2020) that identifies with the unusual culture of an epidemic anxiety that ravages the collective consciousness of Thailand’s people. This epidemic anxiety that has already wrecked the Western nations becomes so inextricably interwoven with the psycho-social and cultural

rubric of Thailand that it cannot be seen apart from the pressing environmental concerns that can have grave consequences for the land and its people. The American mega-corporations and calorie companies investing in genetic modifications have transported their site of operations to Thailand as the Western nations have already given in to the pandemic and their commercial hubs are decimated by heat waves and their shores are submerged by the oceans. The paper will study how the pandemic functions as an interrogator/interlocutor of existential circumstances caused by anthropogenic intervention. The pandemic is therefore a complex, multi-pronged phenomenon that can be considered entangled with the deterioration of the ecosystem as a comprehensive whole. This paper argues that the advocacy function of Bacigalupi's ecospeculative fiction set in a distant future can well be a warning to look deeply into the causes of the current pandemic, which can be traced to human denial and disregard for the wellbeing of the environmental gestalt. Finally, this paper will focus on two aspects: the influence of the Western mercantile enterprises and their neocolonialism based on food generation that transforms the self-sustaining economy of Thailand into a crisis economy forced to choose artificial and synthetic processes of sustenance instead of what the latter had imbibed from nature, and the understanding of pandemic anxiety as an outcome of “ecophobia” (Estok 2013: 2).

Bacigalupi's narrative engages with Anthropocene excesses that result in crop failure and rising sea levels in the city of Krung Thep (Bangkok) in Thailand. The narrative is set in the distant future of a post-fossil fuel economy. Coal and petroleum reserves are subject to relentless extractivist processes across the globe which results in climate change, drowning landmasses and energy scarcity. The entire world is reduced to a salvaging and forage scenario with widespread inequality, violence and a complete breakdown of the institutional machinery. Pandemics and food scarcity have stunted vibrant cities converting them into graveyards. “Cibiscosis” (Bacigalupi 2014: 5) has brought down soaring economies and nullified the promising aims of medical science. Amid the chaos of this withering world, Bacigalupi's narrative reveals the rupture in the social fabric of the constitutional monarchy of Thailand reigned by the Child Queen. The Environment Ministry led by General Pracha and the Trade Ministry led by Minister Akkarat are at constant loggerheads regarding the directives and policies of the nation. The city of Krung Thep portrays a fragile civilisation which has so long resisted the adverse effects of anthropogenic climate change. The country resisted predatory global capitalistic enterprises and survived desperate times by relying on the robust indigenous knowledge of seed conservation. With the inevitable fall of developed nations and the cracking up of global economy, the calorie companies of the West such as AgriGen and

PurCal bring offers of new technologies to Krung Thep, for example “gene-hack” (Bacigalupi 2009: 253) modifications that can increase the crop’s resistance to blister rust and cibiscosis and also provide high quantity yields for surplus production. The corporate calorie companies also introduce GMO (genetically modified organisms) such as the ‘megodonts’ (Bacigalupi 2009: 238), a super elephant resembling prehistoric mammoths, for industrial labour purposes.

This projected future does not have the luxury of aviation. International travel is dependent on dirigibles, giant gas ships that take weeks to reach the other parts of the globe. The depletion of petroleum and coal has brought back manual labour to produce energy that is required for industrial, urban and household requirements. Western capitalists are surprised by the sustainability of small nations like Thailand and enter into business contracts with the Thai Trade Ministry to work for mutual benefit. They expect huge profits and invest their resources heavily to get access to the food and seed resources of Thailand that are nurtured in plenty. The ancient seed bank of the country protected by the “white shirts” (Bacigalupi 2009: 238), the enforcement wing of the Environment Ministry, are guardians of the vast traditional knowledge of food conservation. They have sworn to prohibit any and all transgressions into the only existing nerve centre that helps the country survive in these dire circumstances. The calorie companies are lured by new opportunities to create clones (gene-ripping) of the original seeds that can be sold with high profit margins to nations that have lost their ability of natural food generation. This new commercial approach has induced biological vulnerability to diseases and also facilitated the sharp decline of resistance and immunity among the natives of Thailand. Genetically modified food production ensures higher yields of food crops during the seasonal harvests. In this narrative, gene hacking is a techno-mercantile process that recomposes the genetic structure of food crops and creates hybrid products that can resolve the issue of declining agricultural production and depletion of natural food reserves. The Western (American) “calorie companies” (Bacigalupi 2009: 334) such as AgriGen and PurCal (fictional versions of GMO producers such as Monsanto and Pioneer Hi-Bred) wield considerable influence over farming practices and control the supply-demand chain in the global markets. These companies are the agents of a new form of food and agricultural colonisation that takes over the regional and indigenous food production and conservation practices. Ironically, these genetically modified foods, which are supposed to be immune to crop diseases like blister rust and cibiscosis (Bacigalupi 2009: 4) have largely affected human health. Humans are victims of the synthetic chemical infusions that maintain the structure and composition of genetically modified fruits and vegetables.

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Bacigalupi’s narrative engages with the paradox of the probable intentions of genetic modification, and what ultimately ensues. In a review article of *The Windup Girl* Trish Myles writes,

In Paolo Bacigalupi’s imagined future, Bangkok has become a simmering stew pot of paranoia, brutality, despair, and betrayal. Genetic manipulation has brought the world to the brink of extinction. With great advancements also come tragic mistakes. With blister rust and cibiscosis there is also the genehack weevil that has brought about death and famine. The very companies that created these problems have become indispensable since world has to rely on to stay one step ahead of the mutations of their mistakes. Battling for calories is now an all-consuming endeavour for a population that has rarely had a full belly. An innocuous cough can start a stampede of fleeing people. Fear is the natural state of mind.” (Myles 2017)

Although the author predicts imminent natural calamities that pervade the nation, he never fails to highlight the actions of humans who are damaging their own capacities of resistance. Hence the surviving population of Thailand is threatened by two forces, specifically the epidemiological and the environmental. These equal forces, which are mutually imbricated, propel the narrative. They are fundamental to understanding the scales of anxiety that reinforce the sense of powerlessness among the concerned masses of the narrative. These forces are described as fatalistic equivalents embodying the non-human agencies of destruction that can obliterate humans and their habitat. The pandemic and climate change are like “hyperobjects” (Morton 2016: 11) that engulf the memory and lived reality of Thailand’s inhabitants.

### Pandemic and Neo-colonialism

The pandemic scenario in Bacigalupi’s *The Windup Girl* can be traced back to the concept of ‘ecological imperialism’ propounded by Alfred W. Crosby in 1986. In his book, *Ecological Imperialism: The Biological Expansion of Europe, 900–1900*, Crosby elaborates on the global transfers of organisms that accompanied the European colonial enterprises. He argued that the “portmanteau biota” (Crosby 1986: 89) comprising disease microbes, weeds, domestic plants and animals was instrumental in reshaping the landscapes and environments of the colonised countries. The book explores the idea about how environmental and epidemiological problems in the modern world have a colonial history. Following the global environmental awareness initiatives during the post-1940s and understanding of the ecosystem as a “functional totality of life processes” (Latham 2007: 109), there was a considerable inclination to map the

trajectories through which foreign flora and fauna became a part of 'existing environments' (Latham 2007: 109) in colonised countries. In his magnum opus, *The Ecology of Invasions by Animals and Plants* (1958), Charles S. Elton uses the term "biotic invasions" (Latham 2007: 109) to explain the inclusion of foreign species in existing food chains, which led to conflict for resources with native species and subsequent proliferation through genetic exchanges caused by reproduction. Biotic invasions like "the spread of the Japanese beetle throughout the northern United States and the incursion of sea lampreys into the Great Lakes region" (Latham 2007: 109) caused radical alteration of the region's biota and severely disrupted the local ecosystem. William Cronon in his book *Changes in the Land* (1983) looks into the context of European colonial endeavours in the USA to suggest how the introduction of European livestock and farming practices in the existing environments of the colonised nation indicate the role of human (coloniser) agency in facilitating the processes of biotic transfers. In Bacigalupi's narrative the "genehack" (Bacigalupi 2009: 44) weevil is a genetically engineered beetle that was introduced by an American calorie company, Nippon. The genehack weevil destroys fodder and damages hectares of cropland at an exponential rate. In comparison to the average weevil, the Nippon genehack weevil affects the agriculture and plantation of Thailand on a mammoth scale. The genehack weevil functions in a manner similar to locust swarms that cover the soil and devour the roots and stems of crops. However, weevils are an effective alternative to chemical pesticides since they eat the pests nestling in the plant's body. In the light of this, a more efficient breed of weevils is genetically engineered by Nippon (a calorie company) in anticipation of better agricultural yields. These weevils have the capacity to reproduce at an accelerated rate and their rising numbers were perceived as an army with the capacity to resolve the pest problems around the globe, including Thailand. However, the American experiment backfires and becomes instrumental to the collapse of an age-old natural and sustainable agricultural management practice in Thailand. The mutated version of the genehack weevil increases the vulnerability of seasonal agricultural produce to plant diseases like cibiscosis (Bacigalupi 2009: 50), scabies mould and blister rust. *The Windup Girl* decodes the "facile optimism" (Latham 2007: 108) that functions through the quasi "sagacious scientocracy" (Latham 2007: 108) of the American calorie companies. The author hints at the latent profiteering intentions of the Western mega-corporation and describes how these organisations exploit and destroy the environments of the natives under the guise of development and modernisation. Bacigalupi's narrative analyses how the scientific expediency of the American calorie companies actually contributed to the creation of diseases like cibiscosis in Thailand – which has pathogens that mutate frequently, each

new variant growing stronger, more adaptive and lethal in the course of time. Bacigalupi’s portrayal of American techno-science and its functionality in formulating a pandemic crisis in the self-sustaining economy of Thailand hints at an epidemiological colonialism. The pandemic scenario in *The Windup Girl* is causally connected to the genetic modification enterprises. It directly portrays the way through which the expedient calorie companies unknowingly manufacture diseases and create circumstances of biological vulnerability among the native population. This replication of manufactured epidemiological conditions that has already devastated the West, followed by their subsequent reintroduction in native habitat and environments, offers penetrating insights into the role of diseases that shape the encounters between the colonist’s and the native’s cultures. In this context, Bacigalupi’s *The Windup Girl* runs parallel to William McNeill’s *Plagues and People* (1976), which depicts the European conquest of the Americas and the manner in which the susceptibility of native Amerindians to foreign pathogens like smallpox increased. Similarly, the Thais become vulnerable to diseases like cibiscosis and blister rust created by loopholes in the American techno-scientific processes. The author’s stance vehemently challenges American techno monopolisation and jolts the readers out of a narrow techno-imperialistic delusion that has become normalised due to the denial of the core preservation and conservation practices that had sustained humanity for ages. *The Windup Girl* is a powerful critique of the Western fixation with the genetic engineering and artificial agricultural processes that have had irreparable consequences. Hybrid crops created in the labs of the calorie companies may boost the production but this burgeoning comes at the expense of the health of the Thai natives and their entire ecology.

The pandemic dystopia of Thailand incorporates the idea of disease as a neo-colonial agency. By introducing the pandemic scenario in a dystopian narrative Bacigalupi imagines “possible futures” (Otto 2014: 182) in which the consequences of the conventional ways of “thinking and being” (Otto 2014: 182) are disturbingly obvious. He consciously coalesces the pandemic anxiety with dark practices of globalisation such as privatisation and autonomous control that disregards the significance of traditional knowledge and indigenous life. In response to Anderson Lake’s (a representative of the American calorie companies) persuasive endeavours to gain access to the ancient Thai seed bank to collect samples for genetic modifications, the Thai trade minister, Akkarat observes,

The seed bank has kept us independent of your kind. When blister rust and genehack weevil swept the globe, it was only the seed bank that allowed us to stave off the worst of the plagues, and even so, our people died in droves. When India and Burma and Vietnam all fell to you, we stood strong. And now you

come asking for our finest weapon... No *farang* (foreigner) should ever touch the heart of us. You may take an arm or a leg from our country, but not the head, and certainly not the heart. (Bacigalupi 2009: 142)

Akkarat's reply reinforces the native's resistance to American mercantile and agricultural enslavement. In doing so, Akkarat's statement represents the consciousness of the natives, who can look through the opportunism harboured by the American megacorporations. It portrays the native's sensibility, which works against the market logic that advertises the "utilisation of science in a painfully overconfident way to manipulate the world for greater good" (Canavan and Robinson 2014: 259). Thus, the element of the pandemic functions as an ecological subset that asserts the idea that blinkered commercial policies in scientific processes can only create a "limited futurological horizon for mankind" (Canavan and Robinson 2014: 248). It emphasises the required attention to eco-centric thinking that can substitute the exclusive human fixation on the economic and imperial advancement.

### Ecophobia and Pandemic Anxiety

Apart from complex agro-ecological issues engendered by parasitic calorie companies, the imagined dystopia in *The Windup Girl* is wrecked by diseases like cibiscosis (Bacigalupi 2009: 143) and blister rust. Bacigalupi's narrative portrays the presence of the pandemic as an overarching phenomenon in post-apocalypse Thailand. The pandemic scenario in the narrative exerts a pervasive gloom and uncertainty on the lives of the Thai people. Residents of Bangkok are unable to compartmentalise the pandemic from their lived experiences since over time it has become a normalised aspect of their existence. In the "longue duree" (Braudel and Wallerstein 2009: 176) of epidemiological history, fear has played a significant role in shaping the imagination of people who are affected by pandemic scenarios. In her article, titled "Apocalyptic Fiction Helps Us Deal with the Anxiety of the Coronavirus Pandemic" Katherin Shwetz explicates the impact of contagious diseases that incite fear "partly because they transform other, less concrete fears about globalization, cultural change and community identity into tangible threats" (Shwetz 2020). Pandemics provide humankind the opportunity to realise the "most inchoate fears about our present moment and explore different possible responses to those fears" (Shwetz 2020). A pandemic scenario increases the multi-faceted fears that accompany the reality of change. It reconfigures human cognitive understanding of the present and proliferates into distinct meaning-making processes that redefine human engagement with nature. In an article based on analysis of



the "ecofear problem and ecophobia" (Fisher 2017: 2) Simon Estok's understanding of "ecophobia" (Estok 2013: 2) as a "spectrum condition" (Fisher 2017: 16) elaborates on the concept of ecophobia and stresses its importance as "a cultural-political-philosophical and truly (potential) emancipatory discourse formation" (Fisher 2017: 16). Ecophobia is, however not exclusively related to the experience of anxiety when confronting pandemic scenarios. It also identifies with the "fearism" (Fisher 2017: 3) that is not limited to human psychology but reveals a "more toxic worldview, a toxic ideology, a toxic politics and ultimately an insidious culture of fear" (Fisher 2017: 19). Pandemic scenarios can be considered agencies of ecophobia. Like environmental catastrophes such as earthquakes, hurricanes, tsunamis and floods, a pandemic scenario incites an uncanny sense of fear in the collective consciousness. Paolo Bacigalupi's *The Windup Girl* exhibits this pervading sense of fear, which is so often expressed by the characters in the novel. Hock Seng's (the Chinese refugee) reaction to the illness of Kit and Srimuang (workers at the Kink Spring factory in Bangkok, owned by AgriGen) portrays his rising sense of panic. His skin crawls when he finds two bodies lying beside the kink spring tanks, and he instinctively begins to wipe his hands because "the gray powders of the fining room cling to his palms, marking where he pushed the curtains aside as he passed through. He's surrounded by potential vectors" (Bacigalupi 2009: 154). Hock Seng's reply to Mai's (a factory worker) question, "Do you think it is a pandemic?" (Bacigalupi 2009: 155) explicitly shows his trepidation. He says, "Don't say those words! Do you wish to bring demons down on us?" (Bacigalupi 2009: 155) Trepidation and mortal fear are controlling pivots around which Bacigalupi's narrative revolve. In her book, *The Coming Plague: Newly Emerging Diseases in a World out of Balance* (1994), Laurie Garret refers to toxic shock syndrome and how it bears witness to the fact that bacterial species are in a state of transition and continual evolution. According to Garret, "The mutability of bacteria, coupled with their ability to pass around and share genetic trumps in a microscopic game of cards, seemed to increasingly leave homo sapiens holding losing hands" (Garrett 1994: 411). She indicates the inability of humans to comprehend the effect bacteria on their bodies. Bacterial permeability as a matter of fact produces a glaring uncertainty that encompasses the human consciousness and influences human interaction with the exterior world. Hence the pandemic and its borderless expanse becomes an agent of toxic ecology that defamiliarises a nurturing nature and converts it into a toxic nature. Similarly, the diseases in Bacigalupi's narrative permeate the socio-ecological fabric enmeshing with the lives of Thai citizens. This pandemic entanglement is a key element in Bacigalupi's imagined future that can be observed through the lens of "transcorporeality" (Alaimo 2012: 476) in a

materialist and posthumanist sense of the human as substantially and perpetually interconnected with the flows of substances and the agencies of the environment (Alaimo 2012: 476)

Post-apocalyptic science fiction uses the trope of the pandemic to engage with what Darko Suvin defines as “cognitive estrangement” (Suvin 1972: 372). Pandemic scenarios manifest as states of fear and anxiety by estranging the popular imagination from the necessary optimism that can create a positive outlook. Thus, pandemic scenarios create a parasitic narrative that drains hope by projecting a ravaged world that has gone beyond the possibilities of restoration. On the contrary, by reinforcing this sense of despair and powerlessness in the face of pandemic scenarios, Bacigalupi’s narrative sensitises the popular consciousness with the reality of human denial that leads to a future characterised by chaos and imbalance. *The Windup Girl* represents pandemic anxiety as a mode of mediation between the expedient scientocracy of the American mega-corporations and the sustainable stewardship of Thai natives. In a way Bacigalupi’s narrative uses the genre of pandemic dystopia to rethink remediating possibilities for the ills of the contemporary world so that humanity can recreate ways of implementing conservation practices for a balanced present.

Bacigalupi’s narrative portrays “a temporal displacement of contradictions from the present onto a narrative future” (Bellamy and Szeman 2014: 196) and depicts a bleak future devastated by rising ocean levels, crop failure and widespread pandemics that serve as a spur to ecological thinking action on a global and regional scale. Commenting on the restorative powers of narrative to combat “entropic vandalism” (Weisman 2007: 154) Lauren Berlant states, “contemporary narratives of future change open up the optimistic possibility that the habits of a history might not be reproduced” (Bellamy and Szeman 2014: 199). The pandemic represents an impossible force that deconstructs anthropocentric exclusivity and necessitates the understanding of the porosity of boundaries that characterise the multiple entanglements of the human with the nonhuman world. Excessive, unmindful consumption is a catalyst for the denial of environmental problems and cuts people off from the possibilities of rethinking strategies for sustaining mutual coexistence. Bacigalupi’s fiction outlines this deeply rooted denial by invoking a strong sense of fear that functions as both as a cognitive shock and as a catalyst that can instigate a collective human approach to set a different course for their present. *The Windup Girl*, thereby, participates in the process of reconfiguring “ideological critique” (Moylan 2000: 82) and “social dreaming” (Moylan 2000: 82) through the realisation of pandemic fear that can create a reality beyond the contemporary social order that affects humanity and nature alike. By doing so

this narrative becomes a part of what Tom Moylan calls the “critical utopian tradition” (Otto 2014: 179).

### Pandemic and the “Technologiade”

In the introduction to a collection of ecotopian fictions, *Future Primitive: The New Ecotopias* (1994), Kim Stanley Robinson elaborates on the “crisis facing the human race in the moment of technological modernity” (Canavan 2014: 11). He writes, “We are gaining great powers at the very moment that our destruction of our environment is becoming ruinous” (Robinson 1994: 6). Robinson believes that humanity is undergoing the process of “rethinking the future” (Robinson 1994: 6) as a result of SF’s myriad representations of catastrophic fallouts on a global scale. In the face of alarming ecological conditions, capitalism continues to expand beyond limits, situating itself as a non-optional and persistent mechanism that channels world systems into a vicious circle of consumerism thereby fuelling the popular hedonistic imagination. Paolo Bacigalupui’s *The Windup Girl* offers a multidimensional picture of the pandemic scenario in which the pandemic is presented as not only as an embodiment of ecocatastrophe to sensitise and warn readers but also as an instrument that reconfigures the reader’s perception in understanding the novel from a new perspective. This narrative employs a heterodiegetic approach to focus on witness–participant interaction with the pandemic scenario and engages with the speculative dimensions of readers’ minds. Bacigalupi introduces a new form of epidemiological visualisation that aligns with SF’s narratological structure through the insertion of the pandemic as an ontological marker within the realm of speculative science fiction. As one of the contemporary representatives of the SSF (Speculative Science Fiction) genre, Bacigalupi’s narrative can be studied under three different categories formulated by Istvan Csicsery-Ronay in his work, *Seven Beauties of Science Fiction* (2011) to compartmentalise and subsequently analyse the various strands of the genre. Bacigalupi’s narrative comprise what Csicsery Ronay describes as the “science-fictional grotesque”, “fictive novums” and “the technologiade” (Csicsery-Ronay 2011: 7). These three categorisations help the readers interpret *The Windup Girl* as a key science fiction text speculating a pandemic dystopia. They also highlight the underlying narrative of human resistance in the novel that counters the crises of existence created by the pandemic. The science fiction grotesque explicates the disintegration of the axiomatic categories that is quintessential to the logic of eco-biological relationships, thereby “creating a spectacle of impossible fusions” (Csicsery-Ronay 2011: 7). The visualisation of the grotesque, a “category violating anomalous physical phenomena created by human science”

(Csiscery-Ronay 2011: 7), is disturbing and infused with awe and horror in this narrative. According to Ronay,

Because technoscience is the guardian of the rational categorization of matter, the grotesque attacks the very rationality that made its apprehension possible. This facet, one of the most powerfully attractive of the genre, draws its reason-based irrationality increasingly from actual scientific innovations that combine phenomena previously held to be naturally distinct (such as, for example, genetic engineering, molecular computing, and Artificial Life) and the constant weakening of category boundaries that seems to menace the sense of personal identity. (Csiscery-Ronay 2011: 7)

The technoscientific grotesque is evident in Bacigalupi's narrative in which genetic engineering processes have backfired and created sterile crops, complex parasitic insects like genehack weevils that devour extensive tracts of agricultural land and mutant pest diseases like cibiscosis and blister rust. The natural seed stock has been wiped out through the monopoly of the calorie companies and with the implementation of their technological expertise the people of Thailand are coughing blood after consuming genetically modified fruit and vegetables. Genetic modification processes in *The Windup Girl* undertaken by Japanese techno-industrialists have created a new breed of genetically engineered humans known as the "New People" (Bacigalupi 2009: 35) or the "windups" (Bacigalupi 2009: 37), who belong to a test tube generation. Their genetic structure and physical metabolism are resistant to diseases and they are immune to contagions caused by widespread pandemic. They are endowed with enhanced working capacities and are used as proud models to portray how scientific advancement and human persistence can combat changing natural circumstances. The concept of the new people or 'windup' relates to what Csiscery-Ronay identifies as "fictive novums", an idea that allows him to elaborate on the introduction of a new element or identity that supervenes in the conventional course of life and reconfigures the collective perception of existing paradigms. SSF produces "imaginary models of radical transformations in human history" (Csiscery-Ronay 2011: 6-7). This imaginary model, or the novum (new), is a logically comprehensible "material phenomenon" (Csiscery-Ronay 2011: 6-7) that is the outcome of expedient scientific experimentation. These novums engage with the state of rapidly evolving realities of "techno revolutionary societies" (Csiscery-Ronay 2011: 6-7) that combat unprecedented ecological catastrophes. The pandemic as an unreckonable force of disruption compels human civilisation to manufacture their own defence barriers. The creation of a new generation of genetically engineered people in Bacigalupi's narrative does not resolve the pandemic crisis in Thailand. This

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new breed possesses higher adaptability and immunogenic traits to combat the pandemic; it evolves to live on and coexist with the pandemic. Gibbons, the imprisoned scientist of a Western calorie company says to Captain Kanya of the Thai Environment Ministry that their environment has changed. If the humans intended to stay at the top of the food chain they have to evolve or go extinct like the dinosaurs. His statement,

you die now because you cling to the past. We should all be windups by now. It's easier to build a person impervious to blister rust than to protect an earlier version of the human creature (Bacigalupi 2009: 230)

portrays the impact of a pandemic on a paradigm altering scale. This massive shift in the orientation of the human condition; from the biological to the technoscientific is key to understand the transcendence of the human factor in a posthumanist embodiment. It reshapes a new interaction between techno sapiens and their changed ecology; a ‘technologiade’ that can alter the course of a pandemic dystopia. The ‘technologiade’ is defined as a speculative approach to depict remodelled societies created out of technological advancements. The technologiade identifies with the “contemporary historical experiences of techno modernization” (Csiscery-Ronay 2011: 7) that influence the readers’ reality and dislocate it, linking it with a familiar narrative structure that “recontain radical newness” (Csiscery-Ronay 2011: 7) and functions through “historically ambivalent and complex fables of techno history” (Csiscery-Ronay 2011: 7). *The Windup Girl* evolves into a technologiade rather than being a core dystopic novel expressing considerable pessimism about the future. As a technologiade it does not supplant human civilisation in the wake of deadly pandemic scenarios. On the contrary, it reconstructs a new beginning where Eastern technoscientific advancement (Japanese genetic engineering) through creating a new breed of humans impervious to pandemics counterbalances the expedient scientocracy of the West (American genetic engineering). Bacigalupi’s narrative does not postulate a world of uniformity and balance surviving out of chaos. But it does imagine a future where the idea of “knowing what endures” (Prettyman 2014: 73) can be applied. The technologiade contests the pandemic as a deterrent to an unimaginable future teeming with diseases thereby determining a new and hopeful trajectory where humanity can still consolidate and redeem itself as a species in a brave new world ravaged by the pandemic. This sense of human redemption creates a realisation that reshaping a better world is still within the grasp of humanity and they have “not yet crossed the threshold of the unthinkable” (Otto 2014: 189).

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