Reimagining the (Post)Human in the Age of the Anthropocene:

The Cyborg Figure in *Frankenstein* and *The Windup Girl*

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> "One thing in any case is certain: man is neither the oldest nor the most constant problem that has been posed for human knowledge … man is an invention of recent date. And one perhaps nearing its end."
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> Foucault, *The Order of Things*, pp. 421-422

> "By the late twentieth century … we are all chimeras, theorized and fabricated hybrids of machine and organism. In short, we are cyborgs."
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> Haraway, *A Cyborg Manifesto*, pp. 35

The Anthropocene has emerged as the dominant framework of conceptualizing the geological epoch in which we currently live. It is not so much that the Anthropocene has grown into the position, but rather the reverse: the world has awakened to the reality that the Anthropocene has arrived or perhaps had arrived long before the term had even been invented. Formally coined by scientists Paul J. Crutzen and Eugene F. Stoermer in 2000, the Anthropocene denotes the geological age of humans. Humanity now ought to be seen as the main determinant of the environment, wielding geological force that can transform the most basic processes of the planet. While much of the discourse has been centered on when the Anthropocene began,[1] the more burning question challenges us to reimagine ourselves as a species: How can we envision humans as a force of nature comparable to "an enormous volcanic eruption, an unexpected epidemic, a large-scale nuclear war, an asteroid impact" (Crutzen and Stoermer, 18)? What does it mean that humans have the capacity to bring about our own extinction?

Rather counterintuitively, then, the Anthropocene simultaneously asserts the centrality of the human (*anthropos*) even as we become aware of the precarity of our existence. Yet, the seeming disingenuity of the term belies its underlying posthumanism of how the Anthropocene signals the hypothetical point in time after which humans can never look at ourselves in the same

[1] Contenders include for the starting point of the Anthropocene include when homo sapiens first emerged 50,000 years ago, around 1784 when James Watt invented the steam engine that precipitated the industrial age, when scientists exploded the first atomic bomb in the New Mexico desert on July 16, 1945, and with the Great Acceleration following the Second World War?

way again. The term Anthropocene derives from the etymon *anthropos kainos*, which ecocritics Boes and Marshall translate as the "time of the new man" (62). More than just a historical question, or an ever-evolving story, there in the Anthropocene's etymological roots surfaces an emergent, *post*human condition — a radical rethinking of the category of human. The Anthropocenic posthuman, therefore, is not just about the literal end of the human but also "the end of a particular image of us," of the center of man in humanist,[2] post-Enlightenment thinking (Hassan 845). The productive semantic tension of the Anthropocene reflects the changing imaginaries of the human over the centuries and the epochal shift now necessitated by geological realities. The Anthropocene, then, is a simultaneity that embeds multiple futurities of the posthuman.

As such, the Anthropocene goes beyond stratigraphic dating and becomes an exercise in reimagination. Firstly, it requires that we imagine humans anew on the scale of species-wide extinction, best articulated by the historian Dipesh Chakrabarty: "The human being has become something much larger than the simple *biological agent* that he or she always has been [...] To call ourselves *geological agents* is to attribute to us a force on the same scale as that released at other times when there has been a mass extinction of species" (206-7; emphases added). Secondly, with the onto-existential problem of species extinction comes the challenge that we accordingly adjust our conception of the human, that is, to decenter the human in relation to other ecological coordinates. Humans in the new epoch can no longer simply be defined as acting upon the natural world. Instead, we must confront the possibility that nature will act upon us in return in ontological ways — not simply in the manner of climate catastrophes, but in ways

[2] See Schmeink, especially 29-46, for further discussion on humanism and posthumanism.

that might fundamentally alter our existence as a species — as the ultimate outcome of processes that we humans have set in motion, ironically enough.

Chakrabarty identifies the collapsing distinction between human and nature in his seminal essay "The Climate of History: Four Theses" (2009). He hypothesizes that the "Anthropogenic explanations of climate change spell the collapse of the age-old humanist distinction between natural history and human history" to argue that the human-nature partition has been a historical invention (201). He traces the separation of human and nature from the old Viconian-Hobbesian idea that men can only know what they have created to the realm of history as "purposive human action" as formulated by Croce, Collingwood, and Carr and finally to the sociological or materialist readings that still viewed nature as a "slow" and "timeless" backdrop for human actions (203, 204). In his later essay "Postcolonial Studies and the Challenge of Climate Change" (2012), Chakrabarty builds on this argument, contending that the science of anthropogenic global warming has further blurred the lines between the human and nonhuman, writing, "You have to think of the two figures of the human simultaneously: the human-human and the nonhuman-human" (11). With the Anthropocene, then, the unnatural power of humans has become so large that it is akin to "some nonhuman, nonliving agency" (11). Humans, therefore, must be understood as both unnatural self-created creatures and a natural force in the age of the Anthropocene.

Science fiction (sf[3]), as a genre, a mode, and a discourse,[4] shares particular affinities with the Anthropocene. Not only have ecocritics argued for the Anthropocene to be viewed as "a

[3] Most writers of the field science/speculative fiction eschew the label "sci-fi" (likely due to the fact that it is reminiscent of low-budget movies) and prefer instead "SF" or "sf". More recently, the lowercase abbreviation "sf" has been preferred since *Science Fiction Studies* pioneered the change in the mid-1990s. This essay will use "sf" as an abbreviation for science fiction.

[4] Scholars such as Farah Mendlesohn, Istvan Csicsery-Ronay, and Veronica Hollinger have framed sf as an orientation, a discursive practice, or a broader aesthetic mode that, for instance, evokes a sense of sublime and

science-fiction concept" (Swanson et al. 149) and as a Suvinian "novum"[5] (Evans), but sf is also fundamentally centered on species, that is, the status of humans as species, species boundaries, and the evolution of human life in general — how humans as organisms "change to meet a changing environment" in order not to be extinct, as science fiction writer Isaac Asimov observes (190). Notably, however, novelist Amitav Ghosh has been skeptical of sf's ability to address the Anthropocene, raising the genre's temporality as the biggest concern. In an oddly literalist critique of the genre, he contends in *The Great Derangement: Climate Change and the Unthinkable* (2016) that sf detracts from the urgency of the present with its stories set in the future (72). This reductive sidelining of sf has been controversial. Literary critics, including Ursula Heise, have refuted Ghosh's argument by citing Frederic Jameson's claim of how sf depicts our present society as the past of a future yet to come. According to Jameson, sf conceals a complex temporal structure "not to give us 'images' of the future […] but rather to defamiliarize and restructure our experience of our own *present*," a present that is inaccessible directly because of its sheer immensity (286; emphasis in original). Sf, Jameson insists, thus "enacts and enables a structurally unique 'method' for apprehending the present as history" (288). In this vein, sf is oriented simultaneously towards the past, present, and future, as does the Anthropocene.

While current ecocriticism has usefully examined sf's articulations of climate catastrophes and apocalyptic imaginings of a postnatural world,[6] it uniformly focuses on the environmental aspect of sf.[7] Climate change and global warming are no doubt central

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grotesque. Frederic Jameson argues that sf has an "epistemological function" and can be a form of knowledge about the present (xiv).

[5] The novum refers to the concept of "a strange newness" that produces an effect of cognitive estrangement (4), according to sf critic Darko Suvin.

[6] For some, nature, the wild province apart from man, is already extinct. Even three decades ago, Bill McKibben wrote in *The End of Nature* (1989), "We live in a post-natural world." (49)

[7] For example, bleak cityscapes, apocalyptic climate disaster, and terraforming extra-terrestrial habitats.

manifestations of the Anthropocene; yet, they are symptomatic of a greater need for species self-reckoning and disappearing ontological distinctions in this epochal shift. Broader sf scholarship, particularly in posthumanism, has usefully drawn attention to how sf narratives breach a similar divide between human and nonhuman. Most of all, it is the figure of the cyborg that transgresses and renders obsolete the boundaries between human and animal, animal-human (organism) and machine, culture and nature. Yet, the cyborg's wider connections to the Anthropocene have been mostly ignored. Invented in the 1960s but popularized by Donna Haraway's "A Manifesto for Cyborgs" (1985), the cyborg has come to signal both alternative myth — it offers the possibility of rethinking the human beyond conventional categories of gender, race, class, and geopolitics — and present reality.[8] In encountering cyborg figures, Haraway argues, humans learn "from our fusions with animals and machines how not to be Man, the embodiment of Western logos" (52). By investigating the human encounter with the cyborg in sf, we can better understand the posthuman condition emerging in the Anthropocene.

In this essay, I examine the cyborg figure in two works of sf that were released two centuries apart: the creature in Mary Shelley's *Frankenstein* (1818), which is arguably the world's first science fiction novel[9] and was published at the beginning of the industrial revolution, and the windup girl Emiko in Paolo Bacigalupi's *The Windup Girl* (2009) that was written after the "Great Acceleration"[10] that thrust the Anthropocene into mainstream consciousness. One stitched together from human remains and the other a genetically engineered

[8] Rapid advances in genetics and biotechnology—from the mapping of the human genome in 2003 to the 2019 Crispr-Cas9 gene-edited baby scandal—have replaced the earlier visions of body invasion (prosthetic limbs, genetic alteration, cosmetic surgery) with reconfigurations of authentic "humanness" that are no longer extricable from the machine or the animal.

[9] See Aldiss and Clute for further discussion on *Frankenstein* as the birth of sf.

[10] The Great Acceleration refers to the period accelerating pace of energy use, greenhouse gas emissions, and population growth from 1945 to the present. It represents the most anomalous period in the history of humanity's relationship with the biosphere.

human being with machine-like motion, the creature and Emiko provide crucial entry points to understanding the dissolving distinction between human and nonhuman, and human and nature. As literary critic Pramod Nayar demonstrates, there is a need to radically decenter "the traditional sovereign, coherent and autonomous human" in order to foreground "how the human is always already evolving with, constituted by and constitutive of multiple forms of life and machines" (2). The cyborg, as an embodied posthuman imaginary, implodes the blurring demarcations between human and nonhuman with a force that condenses the scale of the Anthropocene into a moment of encounter. By resituating the cyborg in relation to the Anthropocene, I argue that the cyborg embodies and magnifies as grotesque the uncanny awakening of nonhuman agency due to their categorial liminality and outright transgression of the human-nonhuman distinction; as an embedded signifier of species extinction in its visceral proximity, the cyborg allows the human to think in deep time and to experience the precarity of human existence. The nonhuman, previously repressed by naturalized categories of difference, emerges in the figure of the cyborg to expose and embed the human in a posthuman, Anthropocenic subjectivity.

I. From Uncanny to Grotesque, the Awakening of the Nonhuman

Half a century ago, roboticist Masahiro Mori proposed the concept of the uncanny valley in envisioning the relation between the human likeness of an entity and the perceiver's affinity for it (see fig. 1). According to the model, the sharp drop in affinity, the abrupt shift from empathy to revulsion occurs at a point where robots approach but fail to attain human likeness. Coincidentally, while Mori's model has become the dominant framework in which we make sense of the cyborg, the Anthropocene similarly has been conceptualized in the language of the uncanny, especially in the awakening of nonhuman interlocutors that stirs in us a sense of

recognition that humans were never alone (Ghosh 28-33, 63-66; Morton; Marshall). For both roboticists and environmentalists, human recognition of apparently inanimate, radically nonhuman things coming suddenly alive with agency and consciousness is a sensation that can only be called uncanny. In the Anthropocene, on one hand, humans acquire the status of a geologic force and become, in Chakrabarty's words, "a natural condition" ("Four Theses" 214); on the other, cumulative human actions also animate nonhuman forces that return to haunt us in various shapes and sizes. The sensations of the uncanny are there precisely because the nonhuman ought to be inert and unconscious instead of autonomous and assertive.

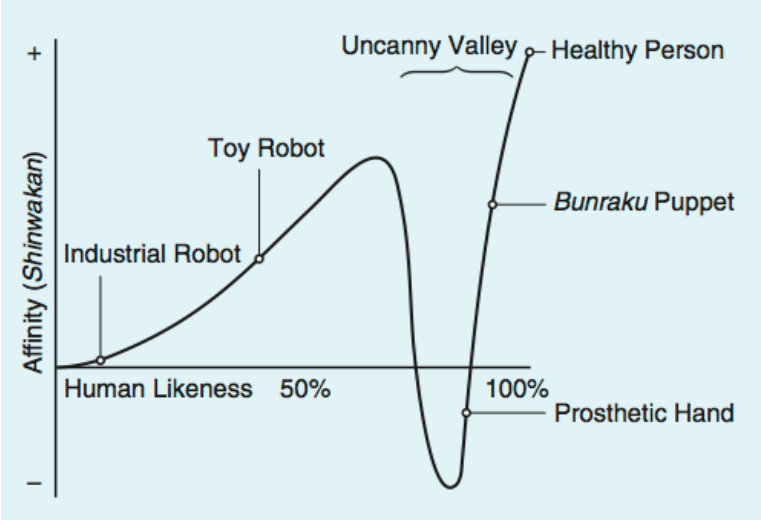

Fig. 1. The Uncanny Valley, graph from Masahiro Mori, "The Uncanny Valley [From the Field]." *IEEE Robotics & Automation Magazine*, translated by Karl F. MacDorman and Norri Kageki, vol. 19, no. 2, 2012, 99.

In *Frankenstein* and *The Windup Girl*, the cyborg figure functions as an extreme manifestation of nonhuman agency simultaneously challenging human control while ironically engendered by humans. By collapsing boundaries in their beings, the creature and Emiko magnifies the uncanny into sensations of the grotesque — inducing fascination and horror in its categorial uncertainty between human and nonhuman. While the creature looks entirely unlike a human in appearance, evoking an immediate sense of the grotesque at first sight, Emiko in her

human appearance is uncanny in her stutter-stop, windup motion. Yet, they each implode the categorical stability of the human by claiming subjectivity. The ontological boundaries of the human, already dissolving in the Anthropocene, come under direct attack by the cyborg.

Frankenstein's creature appears to defy yet typify the cyborg. Upon the novel's 1818 publication, neither the word 'cyborg' (as *cyb*ernetic *org*anism) nor sf as a genre had been invented; modern technology was still in its infancy; it was almost two centuries before the Anthropocene would be articulated. Yet, the creature is also a prescient cyborg, ahead of Shelley's time. In Haraway's words, the cyborg is "precisely where the boundary between human and animal is transgressed" (11), an "illegitimate [fusion] of animal and machine" (57). As a creature made with material from the dissecting room, slaughterhouse, graves, and charnel-houses, the creature is a human-animal, organic corpse, animated to life by what is alluded to be electricity. Already, at its inception, the creature transgresses the boundaries between human and animal. The creature, therefore, can be read as a cyborg, an artificial construct and an illegitimate fusion that makes problematic "the statuses of man or woman, human, artifact, member of a race, individual entity, or body" (Haraway 61). At the same time, however, the creature can also be viewed as a symbol of nature. Literary scholars, including Jonathan Bate and Helena Feder, have written on the ecological parallelisms between the creature and nature: in particular, the creature as an "embodiment of the state of nature" (Bate 52) and "an imprint of the human fear of nonhuman agency" (Feder 65). Indeed, in the tale that the creature narrates, it retreats to nature and lives in the state of the natural man after being abandoned by Frankenstein — eating berries, finding shelter in the woods, learning how to make fire, and developing his consciousness. Despite the creature's repeated attempts to seek human society, it is universally rejected and

ultimately, it ends up returning to the state of nature, swallowed up among the ice and waves of the Arctic. What then do we make of the seemingly conflicting paradigms of cyborg and nature?

It is precisely in its hybrid existence that the creature collapses the binary distinction between human and nonhuman, and the wider persistent dualism of culture/nature. Ontologically, we apprehend the creature as the nonhuman, subhuman other. In the nonontological mode, the creature signifies nonhuman agency staring at us in the face, as the nonhuman wakes up and retaliates — the creature a proximal manifestation of the previously distal threat of species extinction, which the next section will delve into. The redefinition of human subjectivity and agency in this encounter echoes a similar shift as the one that occurs in Anthropocenic self-understanding.

At the moment when Frankenstein beholds the creature coming to life, the light of Enlightenment and triumphant discovery is distorted into the language of the grotesque.[11] Sf critic Istvan Csicsery-Ronay paints the grotesque as "the collapse of ontological categories that reason has considered essentially distinct, creating a spectacle of impossible fusions" (7). Instead of clear-cut illumination, there is only "half-extinguished light" and "the dull yellow eye" of the creature opening for the first time (57). The ambiguity of the first moment of apprehension is made apparent by the murkiness and opacity of color, light, and meaning-making. The disorienting anomalousness of the creature's facial and dermal surfaces — "yellow skin scarcely [covering] the work of muscles and arteries beneath" and "shrivelled complexion and straight black lips" (57) — attacks the very rationality that made possible its genesis. Frankenstein looks at the creature in "breathless horror and disgust," in a sensation of the grotesque (57). When compounded by its gaze and its eyes apprehending Frankenstein in return, the creature implodes

[11] The very origin of the term grotesque refers back to dark and moist interior spaces. See Csicsery-Ronay, 182-215.

Frankenstein's ontological boundaries of what ought to have subjectivity, by being simultaneously thoroughly nonhuman in its physicality while possessing irrefutable subjectivity. What is so terrifying about the creature, then, is not just its appearance, but that "its lack of coherence does not preclude its existence as a subject, a being who can and does return the look of its maker, not as a reflection but as an independent identity" (Fuller 219). As a source of ontological anxiety and by rendering the familiar world anomalous through its inhabitation, the creature collapses the boundary between human and nature — as organic, living, and nonhuman, it is 'natural'; yet, as conscious and artificially constructed by man, it is 'unnatural.' Literary critic Timothy Morton goes a step further to urge us to drop the concept "Nature" — as a normative, nonhuman idea — in order to see that "issues concerning abjection and spectral beings whose ontological status is uncertain and uncanny…are precisely what ecological and evolutionary science begin to point out" ("Ecocriticism" 147-8). Perhaps, it is nature, uncapitalized, that can encompass the ontological uncertainty and uncanniness of nonhuman beings in the age of the Anthropocene. Through the figure of the cyborg, *Frankenstein* decimates the human/nonhuman, life/nonlife, and culture/nature distinctions, and amplifies the uncanniness of the nonhuman with the implosive force of the grotesque.

The grotesque implosion of categorical distinctions also challenges the human-nature paradigm of the Enlightenment years of *Frankenstein*'s composition. Based on Cartesian dualism, which arrogates reason and agency to the human while denying them to the nonhuman, the Enlightenment's valorization of the "pursuit of freedom" sought to impose human reason upon the realm of the nonhuman (Chakrabarty, "Four Theses" 210). Both Robert Walton, on a polar expedition in conquest over nature, and the earlier Frankenstein, intent on uncovering nature's secrets, exemplify Enlightenment ideals. By the novel's end, however, Walton has to

abort his expedition while Frankenstein's life is wrecked by his creation. The creature's ultimate disappearance into the "darkness and distance" of the Arctic upon Frankenstein's death illustrates the nonhuman's resistance of human domination and cognitive division, leaving behind in its wake, hollowness, death, and vacuity (223). The creature, therefore, functions not only as an inversion of the Enlightenment formulation of the human mind's superiority over the nonhuman, but also a manifestation of nature's destructive potential — the grotesque traps the natural sublime in the corporeal body of the cyborg.

Written almost two centuries later, *The Windup Girl* presents an updated take on the cyborg, one that is less monstrous and grotesque, but rather uncanny; irresistibly beautiful and superhuman in its physicality; and one that may not even be easily told apart from a human at all. In Bacigalupi's narrative world, windups — genetically engineered, organic creatures — abound but are treated as "unnatural" (302) and "not human" (35). Though common and accepted in Kyoto, they are discriminated elsewhere as "devils," "soulless creatures," and "an affront to the Q'ran" (35). Their "heechy-keechy" physical characteristic is seen as indicative of their innate, immutable difference from humans — "windups have no soul" is a common epithet and accepted knowledge (37). Seen as programmed "platform[s]" (357) incapable of autonomous thought and feeling, windups are treated as objects for human use and abuse.

Yet, the windup girl Emiko emerges as a nature-culture hybrid that is constantly perceived to be threatening the categorical stability of the human. The relentless, hostile reinforcing of her object, nonhuman status by humans around her — Emiko is called "an alien toy" (36), "disposable" (38), "a triviality of Japanese ingenuity" (38), "Japanese trash" (271), and "animal" numerous times — signals an underlying ontological anxiety about the human vulnerability to contamination, conversion, and eventual displacement of the human species.

When Emiko rebels against her training and genetic imperatives to avenge herself by single-handedly murdering her brothel owner and a client who happens to be the regent to the country's Child Queen, her flare of agency is perceived to be impossible for a windup. That she has shaken off her genetic programming and social training to retaliate against the humans who she ought to serve is perceived to be "impossible" (271), if not "extraordinary" (300). By reconstituting her autonomy, Emiko transcends the subject/object dichotomy and breaches the human/nonhuman divide. In her act of violent resistance, Emiko simultaneously embraces the potentialities in her genes that had previously been repressed — enhanced speed and vision. Her augmented physicality and newfound agency, therefore, reverse and displace the hierarchical dualisms of naturalized identities. In Emiko's individual trajectory, the windup has the potential to be superhuman instead of "almost human" or less than human (34).

Emiko's cyborg liminality also allows her to embody the novel's awakening nature that is no longer static and inert, but one that will also fundamentally alter our existence as a species in return. As generipper (genetic engineer) Gibbons puts it, in a conversation with a Thai Environment Ministry official, "That is the nature of our beasts and plagues […] They have their own *needs* and *hungers*. Their own *evolutionary demands*. They must *mutate* and *adapt*... Nature has become something new. It is *ours* now, truly. And if our creation devours us, how poetic will that be" (246; emphases added)? Human interference and tinkering with nature, instantiated by genehacking in *The Windup Girl*, have animated them to an uncanny agency — the "devil cats," plant diseases, and the rising ocean that devours Bangkok are constantly mutating and inserting themselves into human consciousness. While it is easy to bracket them as nonsentient, Emiko enunciates her "needs" and "hungers" to the human characters around her. The cyborg's rupturing force against the natural/unnatural boundaries, therefore, redefines the human. In *The*

Windup Girl, humans, who perceive themselves as natural and inherently different from the windups, lose their ontological determinacy. Like the plagues that are constantly metastasizing, Emiko implodes the sutures to expose the weakening boundaries and growing fusion between nature and human. If nature in its genehacked, human-altered form no longer seems "natural," then perhaps, humans will have to accept that they too will be irrevocably transformed as nature encroaches and demands that humans evolve to survive.

The cyborg, then, upsets the positional superiority of the human to the nonhuman. In its liminal position between the two categories, the cyborg reveals "Nature" as a human invention. Humans have long projected upon nature the inverse (object, other, unconscious, passive, primitive, resource) of the qualities that we have claimed for our own (subject, self, conscious, active, civilized, agent), which were now forcefully upended by the Anthropocene (Ghosh 68-71; Latour). Nature was demarcated as a province entirely apart from humans and culture, and subjected to the receiving end in a relationship of power, of domination, and of restructuring. With the Anthropocene, nature and human are revealed to be irrevocably tied together all along. Human actions changing the environment, the weather, and other living beings have ironically galvanized nature into retaliation — most potently, in the form of the cyborg. Such category confusions trigger repulsion and disavowal, manifesting in sensations of the uncanny and grotesque. By producing evidence that the senses cannot deny, the cyborg calls into question the continued relevance of the dualisms with which humans have structured and organized the world — dualisms of human/nonhuman, culture/nature, subject/object, agent/resource that are increasingly obsolete in the time of the Anthropocene.

II. From Human to Posthuman, Imagining Species Futures

Two divergent posthuman imaginaries emerge in *Frankenstein* and *The Windup Girl*. While the former warns that modern Prometheanism might culminate in self-destruction and the supplanting of the human species by another that is nonhuman, the latter is more ambiguous. *The Windup Girl* suggests that the anthropocentric drive to dominate nature might erase its difference, irreversibly transforming the human in the process, but not necessarily for the worse. On the one hand, the difference between the two novels might signify the transformation of human attitudes towards nature between 1818 and 2009 — from a locked realm of an undomesticated realm that mankind was finally given keys to but had only just begun to explore to a realm that was no longer 'natural' in the modern sense and had been increasingly altered beyond recognition by human actions with the arrival of the Anthropocene. On the other hand, there is a shift too of human attitudes towards the cyborg, from viewing the cyborg as a species competitor for the future to its representation, two centuries later, in a world in which the cyborg increasingly seems like an inevitability. To use the lens of the cyborg, with all its connotations of futurity and hybridity, is to inscribe multiple temporalities onto a single body. Even as the cyborg impales us to the present moment, its signification of an unpredictable evolution scales up into the vaster temporal horizons of the *longue durée,* gesturing towards what Chakrabarty calls "deep time, the time of evolution of life on the planet" ("Human Condition" 179).

As a novel with three concentric layers, *Frankenstein*'s architecture imitates the Anthropocene: the three nested sets of narratives as a pile of stratigraphic layers, moving through time and space. Each layer peels away to reveal the other — from writer/observer to creator to creature, and then zooming out again in reverse order. In the outermost layer are the letters Robert Walton writes to his sister, in which he describes his voyage towards the North Pole and

his encounter with an emaciated, dying Victor Frankenstein. In the main, middle layer, Frankenstein narrates to Walton how he created the creature and abandoned it in terror, how the creature avenged itself by murdering his brother and wife, and how he finally decided to track it down till destruction which brought them both to the Arctic. At the very center is the creature's narration of his own tale, describing the development of his mind after fleeing from the laboratory and his growing bitterness in the face of violent human rejection.

At two points in the novel, Frankenstein ponders the question of species, with a sharp change in attitudes — from naïve idealism to fear of the demise of the human species. Early on, during his process of creation, he expresses an optimistic vision: "A new species would bless me as its creator and source" (54). Already, he envisions a nonhuman species that belongs to human ownership, existing in a harmonious, if not subservient "gratitude" to their human creator (54). Yet, Frankenstein's blissful picture of species coexistence and continued human domination fractures. With Frankenstein's awakening realization of the creature's polarity unfolds the inverted reality of the creator-creature, human-nonhuman relationship. Instead of his envisioned hierarchical domination over the nonhuman species, Frankenstein finds himself in "slavery" to the creature's demands (152). The creature even outright declares, "You are my creator, but I am your master;—obey" (167). It is when Frankenstein is confronted with the creature's demand that he create a "companion […] of the same species" with the "same defects" that Frankenstein's species imagination grows complex and foreboding (144).

As he is creating a female companion for the creature, Frankenstein is finally struck by the repercussions of his actions on a species-wide scale. Instead of human domination over the nonhuman, Frankenstein realizes the "very existence of the species of man" might become "precarious and full of terror" (165). With this, Frankenstein zooms out into a larger temporal

distance of species evolution, into deep time. Instead of solely focusing on his present individual circumstance, Frankenstein begins to envision the creature's evolution into a nonhuman species that will propagate "a race of devils" upon Earth (165). For "future ages" (166), then, the human species will have to reckon eternally with a nonhuman other that threatens human dominance for all "everlasting generations" (165). Frankenstein's peace, which the creature promised him upon receiving a companion, is therefore at the price of "the existence of the whole human race" (166). By grappling with the species evolutions of the creature and of humans on the scale of deep time, Frankenstein is able to recognize not only his own mortality but also the precarity of human existence as a species when faced with potent disruption by the nonhuman. The revelation that in our attempt to dominate nature, humans too are on the verge of species self-destruction is presciently Anthropocenic. Evolutionary development, which Chakrabarty says humans have taken for granted as "a background to our actions," now erupts into Frankenstein's narrative to influence his choice ("Human Condition" 179). That he has to think of the multiple generations his actions will impact mirrors the long arc and extent to which the human will modify biodiversity in the Anthropocene, including the trajectories of our own species.

Meanwhile, *The Windup Girl* presents a posthuman species future in which humans are irreversibly altered in the process of dominating nature, but perhaps for the better. The novel illustrates a future world suffering from the depletion of petroleum products and a collapse of the world's food supply brought on by the spread of rapidly mutating agricultural plagues. Set in Bangkok, American calorie companies — with genehacked products — attempt to break into the isolationist Thai government's seedbank, which has been aided by a renegade generipper Gibbons. The windups are impossible to discern from authentic, natural humans, apart from a tell-tale "stutter-stop flash-bulb strange" motion (35). The windups are also sterile but are

genetically improved to be faster, smarter, impervious to mutating diseases, and with better eyesight and hearing. Gibbons willingly admits to Emiko that she is "better than human in almost all other ways" (357). Tellingly, the windups call themselves "the New People," implying how they are a newer, more improved version of humans and subjects in their own right (357).

There are two moments in *The Windup Girl* that most noticeably zoom out into deep time. The first is when Anderson Lake, an undercover human calorie man, converses with Emiko on cheshires, genehacked cats with a chameleon-like camouflaging ability. Within twenty years of their creation, the cheshires had eradicated natural felines through mating and cannot since be exterminated despite every human attempt to do so. In a telling exchange, Emiko ruminates aloud to Anderson, "Just think if they had made New People first […] Generippers learned too much from cheshires" (114). Although Emiko does not further elaborate, Anderson thinks of the species repercussions of her voiced hypothetical. If the windups had come first, the generippers would not have made them "sterile" or with the "signature tick-tock motions that make [Emiko] so physically obvious" (114). In other words, the windup body has quite literally been constructed to reinforce their subjugation. Without the lesson of the cheshires, Anderson realizes, "Emiko might have had the opportunity to supplant the human species entirely with her own improved version" (114). Yet, the possibility is extinguished with her "genetic dead end" that dooms the windup species to a "single life cycle" just like other objects, "SoyPRO and TotalNutrient Wheat" (114). While Anderson sees an alternate scenario of human extinction play out in the temporal analog of the cheshire, he barely dwells on the possible evolution due to the present genetic limitations of windups. In his eyes, despite a hovering genetic threat, the windups are still resolutely nonhuman objects, whose genetic makeup makes them comparable to

genehacked natural products — improved but for human use; modeled on humans but decidedly other.

It is in the Epilogue that *The Windup Girl* puts forth new ontological possibilities that blur the human/nonhuman, subject/object, self/other binaries into a polymorphous vision of species development. By the end of the novel, Bangkok dissolves into a civil war — the catalyst being the murder of the Queen's protector by Emiko — and implodes from without, with the collapse of the great walls that have kept the rising sea levels at bay. As humans flee the city, Bangkok is flooded and Emiko becomes one of the sole survivors left standing. In the emptied city, she encounters human generipper Gibbons in a moment when creation meets creator. In their brief exchange, when Emiko vents about her body limitations, Gibbons explains, "Limitations can be stripped away. The safeties are there because of lessons learned, but they are not required" (358). When Emiko questions if he can make her breed true like the cheshires, Gibbons' tone is tentative, spontaneous, and experimental: "You cannot be changed but your children — in genetic terms, if not physical ones — they can be made fertile, part of the natural world […] I can do that for you, and much, much more" (358-9). Gibbons' eyes are "far away," in fact, looking into deep time when the evolution of Emiko's species will play out and become naturalized — "part of the natural world" implies that the windups will effectively become human. In deep time, then, the boundaries between human and nonhuman disintegrate and the ostensible purity and authenticity of humanness will be renegotiated. Emiko and her projected progeny are poised, "like the genetically-engineered cheshires in relation to the feline predecessors they decimated through competition, to put a challenge to the concrete structures of […] "Nature," and the "human being" (Hageman 298). In the deep time of evolutionary life, Emiko's descendants will change the ontological definition of humanness. Commenting on this

shift in scalar perspectives, literary critic Scott Selisker writes that the novel "encourages us to consider the fate of genetic materials over the *longue durée* of an unforeseeable future" (514). The ending, he argues, "asks readers to extrapolate along the line of the gene and to imagine the extreme long-term effects of each new species created or changed through genetic modification" (514). Gibbons' deep-time thinking hints at a posthuman world, in abrogating heterosexuality and dissolving expectations of species reproduction along the lines of the male/female binary. The posthuman condition that emerges also collapses several modes of being into the figure of Emiko: as a nonhuman who signifies an evolving posthuman species; as a nonhuman who signifies the species agency of humans as the makers of the Anthropocene; and as a human-nonhuman hybrid who challenges us to radically rethink what human means in the first place.

As a force of nature, humans need to contemplate the scale of our collective, species agency, which hurtles us closer and closer to the possibility of mass extinction. The cyborg compels us to think on the scale of deep time and to stare the possibility of species extinction in its face. In *Frankenstein* and *The Windup Girl*, the creature and Emiko each herald the possibility of a posthuman species that could evolve from existing humans, collapsing deep time into our own human lifetimes. In our anthropocentric drive to play god or be the modern Prometheus, and in claiming nature as "ours," *Frankenstein* suggests that the result may be the degradation or destruction of the human species in an oedipal apocalypse while *The Windup Girl* imagines a world where the posthuman may signify the passing of the human as we know it, or think we know it.

Conclusion: From Cyborgs to Beyond?

The Anthropocene's challenge for how we can redefine the human is by no means unique. For one, philosopher Michel Foucault anticipated the posthuman as early as 1970,

writing that our category of the human will be erased: "One thing in any case is certain: man is neither the oldest nor the most constant problem that has been posed for human knowledge […] man is an invention of recent date. And one perhaps nearing its end" (421-2). The posthuman challenge has long been posited in relation to the structural others of humanist thinking.

Yet, the posthuman challenge that the Anthropocene poses is unique in its consequences. Not only does it fracture the determinacy of what human means in relation to the nonhuman, but the Anthropocene also fundamentally requires us to redraw the parameters for the continued existence of human life. More than an onto-existential question, the Anthropocene leaves us standing on the precipice, staring into the abyss of mass extinction wrought by our own hands. It is upon the presumed categorical stability and exceptionalism of the human that we have plundered Earth's resources and asserted our dominance over all other living beings. We are the first species to achieve the sheer scale of geological agency that can alter the climate and Earth's geology for millennia to come. We are also alone in that we are one of the main drivers behind the Sixth Extinction, which will annihilate humans and up to three-quarters of other species on Earth.[12] However, the Anthropocene remains difficult to grapple with because of its scale and projective distribution. We cannot experience it all at once in our own backyards: there may be no single cataclysmic event that announces its arrival, like the asteroid that wiped out the dinosaurs 66 million years ago. What then can we experience?

The possibility lies within the limits of our imagination. We need to reconstitute a posthuman condition in the age of the Anthropocene that allows us to take on a planetary, species-wide, geo-centric perspective that can contemplate both a world in which we are no longer recognizably human and a world without us. The cyborg, as "transgressed boundaries,

[12] See Kolbert for further discussion on the loss of biodiversity in what is a man-made mass extinction, the sixth that the planet has seen in 4.5 billion years.

potent fusions, and dangerous possibilities," allows us to experience the disorientation of crumbling categories, the uncanny coming alive of the nonhuman, and the proximity of species extinction embedded in its body (Haraway 14). Its implosive power lies in its shattering then re-etching of our sense of self. When encountering the cyborg, nature becomes uncannily unfamiliar or unhomely — just as how the Anthropocene has made us suddenly aware of our planet becoming increasingly inhospitable. In confronting the cyborg, we undergo an intimate experience of human agency's ability to create that which can destroy us that the Anthropocene too compels. In the face of that which is nearly but not quite human, we find that we are able to conceive of ourselves as species.

In the Anthropocene, then, the posthuman condition can perhaps find articulation in the figure of the cyborg. In our own categorial liminality as human-human and human-nonhuman, our scalar ambiguity as individual and species, and our bodies as assemblages enmeshed and inscribed upon by the environment and life forms around us, are we not cyborgs ourselves? Haraway, so prescient in her formulation, has the answer: "By the late twentieth century […] we are all chimeras, theorized and fabricated hybrids of machine and organism. In short, we are cyborgs" (35). More than that, nature and the nonhuman have written themselves into the fabric of our lives. Perhaps, we only ought to look at the cyborg figures abound in fiction to realize that we are looking at our uncanny double, a caricature of our wilful inability to surrender our sense of human exceptionalism, and the specter of our ecological past, present, and future. The cyborg is us.

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