



Ice and Ecotrauma in Isaac Asimov’s “The Martian Way”

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Abstract: This article examines Isaac Asimov’s novella “The Martian Way” (1952) as a work that exposes the entanglements of the trauma of the environment with the ecological trauma of the humans. The narrative re-envisioned the Cold War energy crisis for a future era and visualizes the pursuit of hydropower as the appropriation of one of the ice fragments of Saturn’s rings. In doing so, it problematizes space mining and the traumatization of the environment. I examine the infliction of varied forms of violence on ice in “The Martian Way” and underscore human blindness to nonliving or inorganic matter. This analysis of the novella also focuses on how human characters suffer the consequences of their own violence on the environment they transform. Mobilizing the concept of ecotrauma, I demonstrate that the ice in “The Martian’s Way” agentially responds to anthropogenic violence. This article contributes to ecocritical discussions on the ethical mattering of inorganic matter such as water. My analysis encourages thinking beyond a singular species and necessitates a critical environmental perspective that includes nonliving entities within the domain of ethical mattering and thus moves beyond life-centered environmental worldviews.

Keywords: ice, ecotrauma, space mining, anthropogenic change, environmental ethics, matter, science fiction

1. Introduction

Isaac Asimov’s “The Martian Way” (1952) explores how the quest for unbounded water resources and territorial expansion is made possible through

anthropogenic change¹ but only at the expense of traumatizing the environment. The concept of ecotrauma is mostly understood as the distress humans experience in response to natural or anthropogenic ecological catastrophes, but it also describes the concomitant trauma experienced by the environment. Even though there is a growing body of work on ecocatastrophes and nonhuman agency, narrativizations of the traumas of the environment have received little attention in ecocritical research.² Through the lens of the human characters, Asimov's novella confers agency to nonliving matter and recenters the entanglements of human and nonhuman suffering as consequences of anthropogenic violence.

Colin Davis and Hanna Meretoja point to the root of the word trauma: "A trauma originally referred to a physical injury requiring medical treatment. It derives from the Ancient Greek word for 'wound'", but "since the nineteenth century the term has mutated so that it is now primarily used to describe emotional wounds" (1). In my reading of "The Martian Way," trauma is traced back to this original understanding of the term, and it involves both material and emotional experiences. Timothy Morton defines ecotrauma as "the very genuine pain felt by anyone with a pulse at the state of Earth today." Focusing on reciprocity between humans and the environment and building on Anil Narine's concept of ecotrauma in cinema as "the harm we, as humans, inflict upon our natural surroundings, or the injuries we sustain from nature in its unforgiving iterations" (9), I analyze not just harmful psychological and emotional experiences like grief and anxiety but also unpleasant physical and material experiences. The term ecotrauma is applied to both nonhuman and human subjects in my analysis of this novella, and it highlights the reciprocal suffering between them as the consequences of anthropogenic actions. "The Martian Way" depicts how territorial expansions in transplanetary science fiction come at the cost of traumatizing the environment. The narrative oscillates between wounds inflicted on the environment by anthropogenic activities and the trauma experienced by the human characters.

At the same time, the narrative also depicts the environment as agential and reactive. Agency is defined by Bruno Latour as the "power to act" (4, emphasis original). Carl Knappett and Lambros Malafouris oppose the conception of material agency as equivalent to "intentionality" and as being formed by human "consciousness" (ix). Interpreting the term non-anthropocentrically, Veronica Strang notes that "using the term 'agency' is indeed problematic if we assume that it entails sentience or intentionality," "but if we define it more precisely as a capacity to act (upon), it is possible to excise intentionality from the equation" and then affirms that all matter is agential (165-166). Within this framework, this article offers a reading of the text in which the environment or the ice, is traumatized, yet agential. This article's dual focus on the environment and the humans invites a dialogue with

¹ Horn and Bergthaller define "Anthropogenic changes" as caused by "human practices and technologies that have brought about the global change" (37). Davis & Turpin delineate "anthropogenic effects" as "including, but certainly not limited to: the rise of agriculture and attendant deforestation; the extraction of coal, oil, and gas, and their atmospheric consequences; the combustion of carbon-based fuels and emissions; coral reef loss; ocean acidification; soil degradation" (4).

² However, for instance in science fiction, the theme of planetary consciousness has been the focus of attention in works, such as Joan Slonczewski's *A door into Ocean* (1986).

ecotrauma, tackling both humanity's abusive relationship with the environment, which involves blindness to inorganic matter, and the potentiality of the environment to react to this relationship.

"The Martian Way" (1952)³ primarily problematizes the appropriation of water as a natural resource. The story opens as the Martians, the third generation of humans inhabiting the colonies on Mars, are experiencing a shortage of water resources. The story recounts events focalized through a third-person omniscient narrator. The protagonists of the story, Mario Rioz and Ted Long, through whose dialogues the plot unravels, are space scavengers. Meanwhile, an anti-waste campaign on Earth is gaining traction, and its spokesperson, Hilder,⁴ is campaigning to stop the transfer of Earth's water to the Martian colonies. The Martians are therefore at risk of having to abandon their homes and return to Earth. Under this pressure, the protagonists embark on a year-long journey to Saturn to remove a section of one of its ice rings⁵ and bring it back to Mars, where it will provide a natural resource for the much-needed water. While cutting and molding a fragment of Saturn's rings, the characters suffer the impacts of engineering, including physical injury and emotional distress. Ultimately, they succeed in dislodging a massive chunk of ice from Saturn's rings, which they take back to Mars to combat the shortage of natural resources on their planet.

"The Martian Way" problematizes mining and engineering in space by reflecting and underscoring a resource crisis that was foremost in the extratextual context of the novella and still is today. The novella's author, Isaac Asimov, along with Robert A. Heinlein, was the dominant figure in science fiction in the 1940s and 1950s (Patrouch 28). These decades were impacted by Cold War geopolitics and territorial expansions. Many of the thematic anxieties and tensions of the Cold War have fueled the ideology and world-building of "The Martian Way." For instance, the rivalry between the US and Russia over resource management and stellar expansion is parodied by the confrontation between the Indigenous people of Earth as the Russians and the immigrant Martians as the Americans. An urgent and prevalent resource crisis in the 1950s was that of water scarcity and drought due to low "precipitation," especially in the US "Midcontinent" (Nace and Pluhowski 1). During the Cold War period, the construction of dams on major rivers in "Asia, Africa, the Middle East, and Latin America" "under the auspices of programs of water resource development" was a strategy deployed by the US government as "an effort to convince newly independent states of America's support and good intentions" and to curb the "spread of global communism" (Sneddon 564). The dominance

³ The novella is among the most "critically acclaimed" short fictions in Asimov's monumental oeuvre, and it was selected by the Science Fiction Writers of America to be anthologized in the second volume of *The Science Fiction Hall of Fame* in 1972 (Patrouch 233). The text was also included in the collection of Asimov's short texts, *The Best of Isaac Asimov* (1973).

⁴ David Seed writes that "the fifties produced a number of specific parodies of McCarthy and his witch-hunts" (71), and "The Martian Way" is among these texts (80). In his autobiography, Asimov addresses the story and maintains that it revolves around his idea of "McCarthyism" and how the Martians, troubled by a "McCarthy-style politician," surpass the problem (*In Memory Yet Green* 650).

⁵ According to NASA "the particles in Saturn's rings are composed primarily of water ice" ("Saturn's Rings").

of water in the novella thus alludes to Cold War water management strategies and the appropriation of natural resources in general.

In the novella, the water shortage can only be resolved through expansion into outer space and the commodification and appropriation of untapped natural resources. Attention shifts from the local and finite resources of Earth, and even Mars, to the seemingly unending resources of the universe. By creating an imaginary of access to water beyond Earth, the novella also materializes the fantasy of the "cowboy economy," characterized by unending prairies with vast resources for humans to utilize (Boulding 339).⁶ In this novella, the environment beyond Earth is ideologically portrayed as an empty space without life that is fit for exploitation. As Long, one of the characters states: "The water there is just floating around in space for the taking" (Asimov 24). The text comments on a capitalist and colonial expansion that hinges upon the production or appropriation of new resources for living. This fantasy of transplanetary territorial expansion is the setting for the entanglement of human and nonhuman ecological suffering. I will first analyze the story's depictions of ecological anxieties and traumas experienced by the human characters facing a shortage of water resources, as well as the material suffering of the environment (particularly the ice rings of Saturn, which undergo anthropogenic intervention). Then, I will demonstrate how ice reacts to anthropogenic change. I argue that even though the story explicitly narrates violence against the environment, it implicitly opens up space for reflection on the environment's suffering. My analysis of ecotrauma in "The Martian Way" advocates for the rights of inorganic matter beyond the chains of life and contributes to discussions on environmental ethics by reflecting on space mining.

2. The Interplay of the Traumas of the Human and the Environment

The scavengers' experience on the ice rings of Saturn, as the point of narrative conflict, embeds the human traumas within those of the environment. There is an action-reaction relationship; the characters become suffering subjects as they damage the environment. These traumas are both emotional, i.e., sequences of anxiety and hopelessness, and physical, i.e., injuries and material harm. Having arrived on Saturn's rings, the protagonists experience anxiety and distress as they begin to shape the ice fragment. In the scene where the protagonists use a heat projector to mold some of the fragments for transport, this physical suffering of the human characters is tethered to their emotional distress. The text notes, "Rioz was swearing fluently and nearly continuously. He continued to have the impulse to drag the back of his hand across his forehead in order to wipe away the accumulating sweat" (36). The word "swear" parallels "sweat" and creates a sense of physical and sensory anxiety, while the habit of wiping away the sweat is rendered in a psychosomatic way. The

⁶ In line with the concept of "cowboy economy" (Boulding 339), Gerry Canavan notes that in spite of the ecological restrictions that humans confront, "late capitalism remains a mode of production that insists (culturally) and depends (structurally) on limitless expansion and permanent growth without end" (5).

character's behavior is explicated using the words "impulse" and "continuously," both of which resonate with a habit or a compulsion. Indeed, the novella ties the effect of being on the ice directly to the emotional state of the characters: "Ted Long wandered over the ridged surface of the ring fragment with his spirits as icy as the ground he walked on" (38). Asimov thus draws an analogy between the coldness of the environment and the character's emotional turmoil, highlighting how the character's emotional experience depends on the physical features of the environment.

The story also ties the physical experience of the characters to the physical damage and disfigurement inflicted on the ice rings. The text describes the process enacted on the ice fragment: "The material of which the fragment was composed bubbled and vanished under its touch. A section of the lip of the tremendous cavity he had already carved into its substance melted away and a roughness in its contour had disappeared" (36). The material violence inflicted on the body of ice, which ranges from creating holes to partial melting and total evaporation, is followed and paralleled by the physical hardship the characters endure. While Keralski, a crew member, is moving the heat projector to melt an area of the fragment, he injures his foot severely, and the situation is described as follows: "His crushed ankle had been the first casualty of the expedition" (36). Keralski's crushed ankle resonates with the disfigurement and physical change of the body of ice in this environment. This casualty is thus not the first casualty of the expedition but only the first human casualty, as the description of the ankle injury follows that of the cavity made in the body of ice and its subsequent shrinking. Where one is rendered as simply a change in state, from ice to water vapor, the other is rendered as a mutilation. Yet, these physical injuries to both humans and the environment can be read as actions and reactions; each reaction brings about another chain of occurrences. The narrative illustrates this interdependency by portraying the physical trauma of the human character as the consequence of the physical damage inflicted on the ice ring. The chain of actions and reactions continues further as physical injuries lead to psychic consequences: After the foot injury incident, the rest of the crew becomes deranged, restless, and exasperated. The initial ecstasy and euphoria that space travel had for them is gone, and they become the victims⁷ of their own violence.

The interlinking of physical and psychic, as well as human and environmental traumas, in the novella corresponds to Reza Negarestani's description of trauma: "There is no single or isolated psychic trauma (all traumas are nested), there is no psychic trauma without an organic trauma and no organic trauma without a terrestrial trauma that in turn is deepened into open cosmic vistas" ("On the Revolutionary Earth"). The traumas of humans are embedded within the environment's traumas; they are interdependent experiences. These entanglements challenge the conception of human psychological trauma as a distinct and exclusive experience separate from environmental traumas. However, the suffering of the environment mainly remains an epistemic blind spot within the text. The reader gains insight into the environment's suffering under space mining primarily through secondary subjects – humans – and their turmoil. This is partly because inert objects elicit

⁷ Zhiwa Woodbury points to human beings' "dual role as both perpetrators and victims" in climate trauma (4).

weaker forms of attention. We are more likely to pay attention to and have empathy for the loss or displacement of a plant than a stone because we associate the former with life, growth, and movement. The story does not portray the ice fragment as agential solely due to its motion being impacted by humans; yet it underscores the agency of ice mainly after the engineering work changes its motion. The novella casts light on this blind spot by highlighting the movement of the ring fragments impacted by human intervention on the rings as evidence of the environment's suffering, rendering the fragments as natural elements with their own agency.

3. Connecting Loops: The Agency of Ice

The narrative legitimizes the violence inflicted on the ice rings by depicting them as separate and independent fragments. The characters perceive the rings as separate, disconnected pieces that orbit around the planet, rather than as a complementary unit of a planetary system. Here, Saturn is not a self-contained holistic system, but the amalgamation of separate objects, bodies, and fragments. The initial confrontation with the fragment to be dislocated indicates this perspective:

Below him ... was one of the ring fragments. It looked like a large, irregular splotch, marring the symmetry of space, three-quarters in brightness and the night shadow cutting it like a knife. Other fragments were farther off, sparkling like star dust, dimmer and thicker, until, as you followed them down, they became rings once more. (Asimov 34)

In the fantasy of colonial appropriation, the ice fragments of the rings are extraneous entities and disposable objects. They are portrayed as potential assets to be exploited for the Martian economy. However, at times, the fragments are described as part of a whole. This approach is visible, for instance, when the narrator questions the possibility of the mission and says, "Would they be able to control jets with enough delicacy through leads slung across two miles of ice to manipulate out of Saturn's dragging gravity?" (40). Here, the ice forms part of a larger system surrounding and incorporating the planet Saturn.

Although the novella mainly portrays the human characters as individuals separate from their environment, and the ice fragments as separate from Saturn's planetary system, it occasionally connects them, as above, to highlight the situatedness of traumas. While the crew is conducting engineering and space mining on one of the ring fragments, attempting to detach it, they find solace in floating in space and gazing at the beauty of Saturn. Criticizing the people of Earth for their lack of adventurousness, Rioz notes, "They wouldn't appreciate what it's like to float and look down on Saturn" (35). The aesthetic visual pleasure of looking at a planetary being renders it possible to bond with it. The "traumatic loss of intimacy" with the environment is the main factor driving "human-upon-nature" "violence" (Amorok 29), and in the floating scene there is a suspension as the protagonists take a break from inflicting this violence and instead (re)connect with their environment.

Floating above Saturn offers the protagonists a unique way of relaxing and easing their distressed minds during mining and engineering. The novella explicates the contrast between their experiences working on the fragment and floating in space during intermissions: “The work shift of the ring fragment was the tail of the coin. The weightlessness, peace, and privacy of the space-float gave place to something that had neither peace nor privacy” (Asimov 36). The parallel between the detachment of the ice fragment from Saturn’s rings and the psychic detachment of the characters from the environment during their engineering work is followed by the sessions of floating in space and forming a visual and emotional connection with Saturn. Paradoxically, it is the human protagonists’ physical detachment from Saturn’s rings while they float that allows them to emotionally reconnect with the environment. This complex entangled relationship between physical and psychic attachments directs our attention to the dual violence of anthropogenic actions on both the environment and the humans themselves.

The novella portrays the movement of the ring fragments in a way that reaffirms their connectedness within a system. It exposes how human intervention on the fragment affects its motion and endangers the lives of humans. Matt Edgeworth defines material agency in the context of rivers, as “a force to be reckoned with” (159). The motion⁸ of the ice rings is also representative of a force and an action and renders the rings as agential. On a similar note, Karen Barad writes that “matter is not immutable or passive,” further defining matter as “not a thing, but a doing, a congealing of agency” (“Posthumanist Performativity” 821-2). According to Barad, “Matter feels, converses, suffers, desires, yearns and remembers” (“Matter Feels” 59). The text initially depicts the ring fragments’ momentum when the characters arrive at Saturn’s rings and notice the fragments for the first time: “The fragments were motionless, but that was only because the ships had taken up an orbit about Saturn equivalent to that of the outer edge of the rings” (Asimov 34). But it is only when the motion is interrupted by human conduct and the fragment on which they work goes awry, thus endangering their lives, that attention is given to the movement of the ring fragments.

Halfway through the engineering work, the characters realize that after blasting the fragment they are working on, they have “changed its orbit just a bit” (41), causing a nearby fragment to approach them threateningly. In a chain of actions and reactions, this movement imbues the fragment with agency, responding to the violence that has been imposed on Saturn’s system. The novella invests in the momentum of the ring fragments as a forceful action and represents the ice as an actant. In the discussion on the material agency of water and how it influences, for instance, the way it is contained and transported by humans, Strang writes that “all things will present specific constraints and opportunities” through their different characteristics, “thus bringing material agency to the design of the technologies and practices through which human agency is exerted upon them” (166). The human characters are subjected to the movement of the ice fragment they have selected to dislocate. Agency is not

⁸ Reflecting on the agency of ice in the context of Earth, a glacier’s movement as a result of “the pressure of its own weight” (“Science of Glaciers”) or its melting due to climate change can be understood as instances of its agency.

"one-sided and unshared" (Rezaii 116); humans impact the environment and are then affected by the environment.

The movement of the rings is portrayed as the reaction of Saturn's ice rings to the human-induced change, exposing the aftermath of space mining and illustrating the characters' fear of retribution by a planetary system. The text reads:

It was the nearest fragment of the rings, quite close considering that they were at the outer rim of the rings, where the pieces spread themselves relatively thin. It was perhaps twenty miles off, a jagged mountain, its shape clearly visible. (Asimov 40)

Ultimately, the protagonists ascribe a name to the fragment: the Shadow. The agency of the ice is only fully recognized by the characters for the first time when it is about to wreak appalling havoc on humans, at which point it is named. This situation is analogous to the contemporary concerns raised by NASA about the melting polar ice leading to sea level rise ("Understanding Sea Level"). Although scientists have long been aware of polar ice, it only garnered attention in the public domain when its melting threatened to provoke severe consequences on Earth, which would radically affect the everyday lives of human beings. The motion of the rings can be interpreted as a form of revenge by a planetary system. Ted's comment that "the Shadow is creeping in on" (Asimov 42) the characters is a paranoid imagery that metaphorically allocates some form of intentionality to the fragment and renders it a suffering subject that can wreak revenge.

The newly observed movement of the fragment causes fear and anxiety for the characters since the two fragments might collide. *The Comprehensive Textbook of Psychiatry* categorizes "intense fear, helplessness, loss of control, and threat of annihilation" as markers of psychological trauma (qtd. in Herman 33). Considering that the narrative renders the encroachment of the Shadow as a consequence of the protagonists' conduct on Saturn's rings, this approaching fragment could be seen as the Jungian archetype of the shadow. According to Carl Jung, the shadow can "be inferred from the contents of the personal unconscious" and forms the "collective unconscious" (144-5). He writes:

The shadow is a moral problem that challenges the whole ego-personality, for no one can become conscious of the shadow without considerable moral effort. To become conscious of it involves recognizing the dark aspects of the personality as present and real. (145)

When the characters encounter the Shadow fragment, they acknowledge the ethical implications of their work on the rings with the interpretation of the movement of the Shadow fragment as revenge. This is similar to the Jungian conception of the shadow, which entails a self-reflexive confrontation with moral obligations. The characters face the effects of their work through being exposed to the Shadow fragment of ice. They are indeed in the proximity of the Shadow fragment from the very beginning of the engineering process, but they do not notice it during this time. The Shadow's sudden appearance as a threat displays the material implications of space mining on the ice rings: in an environmental system, playing the role of God and altering elements always has

consequences. Along with the material implications, the sense of ecological anxiety that the characters feel when confronted with the Shadow fragment occurs because the Shadow exposes its “non-material agency” (Strang 166) too. As Strang notes, “things present potential symbolic imagery (such as visions of flow) as well as expressing energetic physical forces” and induce “human affective and imaginative responses to the materiality of things” (166). Here the characters’ interpretation of the movement of the Shadow fragment as revenge, which is influenced by the sense of their destructive conduct on the rings, presents the potentiality of ice to generate meanings.

The Shadow’s movement reminds the characters of the interrelated system of Saturn’s rings – a system that can be disturbed, diverted, and wounded and can ultimately return to traumatize other characters. Anil Narine states, “a traumatized Earth begets traumatized people;” the natural world “sustains and endures trauma as a human victim would” (13). Engineering the body of a system disturbs the equilibrium and causes other parts of the system to stray. Subsequently, the traumatized geography’s reaction causes anxiety and fear in the characters. The confrontation with the shadow is portrayed in one of the workers’ comments: “I’ll be damned!” (Asimov 42). The narrator resumes: “Once they noticed, all did. It became the most astonishing fact in the Universe” (42). Someone else says: “Look at the Shadow!” (42). As the text describes: “It was spreading across the sky like an infected wound. Men looked at it, found it had doubled its size, wondered why they hadn’t noticed that sooner” (42). Once Ted beholds the Shadow, he comments: “We can’t leave’ ... ‘Now the Shadow is creeping in on us because our blasting has thrown us out of orbit. We’ve got to change that by continuing the blasting” (42). In order to fulfil the mission and protect themselves, the characters need to continue the explosions. Yet, mining and engineering on this fragment inflicts localized pain on Saturn’s rings and on the characters. The team is thus aggravated by the possibility that, if the Shadow collides with the ring they are working on, the smaller one will be destroyed.

Portrayed as an “infected wound” (42), the Shadow embodies the material trauma of space mining, depicted as suffering a deep pain that may yet spread further. The “wound” resonates with the originary meaning of trauma as a material injury that all entities can experience. According to Hugo Gernsback, during times of difficulty or failure in experiments, humans always blame natural elements when the fault should lie with their “lack of knowledge of inanimate things” (166). “The Martian Way” illustrates how humans have figuratively and materially wounded the rings, provoking a chain reaction that echoes through the system of Saturn’s rings. Yet, in this scene, the characters project the environment as the origin of their troubles, as the culprit rather than the victim of human trauma. These conflicts are ultimately resolved before the environment can exact its revenge as the characters successfully load and transfer the ice fragment to Mars, heralding Martian independence from Earth. While this independence may be celebrated, it also shows how the Martians, rather than learning from the environmental mistakes of their forebears on Earth, have merely replicated their detrimental practices, turning Saturn into both the location and subject of their neocolonial expeditions.

4. Denaturalized Ice

Traumatization of the ice is followed by its denaturalization in the text. Brought to Mars, the fragment is portrayed not only as ice but also as an object of technological subjugation. While the crew is entering the atmosphere and attempting to land, the narrator notes, "As it dropped still closer, the bright dot at the upper end took on a crudely cylindrical form The cylinder dropped toward the ground with the ponderous slowness characteristic of space vessels" (Asimov 47). The fragment is visually similar to a spacecraft but yet is a piece of natural matter bearing scars on its body. The text further accentuates this analogy when, seeing the fragment for the first time, Sankov, the head of the Martian colony, points to this similarity and notes, "That thing that looks like a spaceship is just a mountain of hard water" (48). The storyline presents the ice as an amalgamation of the natural and the human-made, an in-between object that bears the marks of anthropogenic actions on its body. The ice that is ultimately brought to Mars is matter that testifies to its material suffering through its scarred and denaturalized body. The Martians stand still and look at the emaciated body of ice. The text indicates that the engineering work done on its body has impacted its naturalness. The novella accentuates the technological dominance of the Martians over nature as they not only transfer an ice fragment from Saturn to Mars but also transform and shape it. This technologically altered body of ice is in contrast with the representations of ice that are "raw and untrammelled by human intervention" (Dodds 101). The ice fragment is encountered by the inhabitants on Mars as a molded, scarred, and engineered body where the natural and the technological intersect.

Ultimately, the ice fragment ensures the Martians' access to hydropower. The presence of the fragment on Mars is material proof that the Martian colony has won the water war with the people of Earth. In the denouement, Sankov remarks:

Once we get this thing really organized, we can have water stations on the moons of Saturn and Jupiter and on the asteroids. We can scale in chunks of Saturn's rings and pick them up and send them on at the various stations. (Asimov 48)

Now, the Martians identify themselves as the colonizers of the entire galaxy. Here, the Martian way, much like the Cold War American way, evokes expansion and appropriation, reducing abiotic environments to objects for exploitation and commodification. Space mining, as the central trope of the novella, thus necessitates rethinking, ecocritically, of how matter matters.

5. Ecoethical Re-evaluations: On Mattering

Space mining is the central anthropocentric trope of the narrative, and it subjugates abiotic components and matters in geographies to legitimize the violence done to them. This theme perfectly reveals how entangled the experience of the human characters is with that of the environment and how they end up suffering the consequences of the violence they inflict. The story underscores that not acknowledging the connectedness of all matter in an

environment only reproduces anthropocentric actions and outlooks. Although biocentrism⁹ in environmental ethics aims to recognize this entanglement by disturbing the hierarchies among species (Torralba et al. 25), another ladder or hierarchical relationship still needs to be cast off. In the book *The Death of the Ethic of Life*, John Basl takes welfare as the criterion based on which an entity's moral status is estimated and argues that "nonliving" entities such as "artifacts" are also entitled to "having a welfare" (130, 139). In the case of the novella, the narrative disregards inanimate entities as unworthy of moral considerations and revolves around appropriating the ice fragment as an asset for Mars's economy, as Sankov joyously announces in the denouement: "Write down that we'll sell water to Earth" (Asimov 48). Thus, the ice is delineated primarily as a significant economic entity but one which, if we follow Basl, should also be worthy of welfare and care. Arne Næss's deep ecology as another strand of environmental ethics inclusively makes use of the word "life" to "refer also to what biologists classify as 'nonliving': rivers (watersheds), landscapes, ecosystems" (4–5). Næss's deep ecology allocates "inherent value in a natural object" (5) Reading the novella through the lens of ecotrauma allows us to rethink the protagonists' reduction of ice to an economic and material resource, considering instead how all matter that is part of an environment – whether living or nonliving – should be cared for. Environmental thinking must be disentangled from biocentrism for humanity to think beyond Earth-centric thought and their own species.

Without attention to inorganic and nonliving elements, such as water, environmental thinking would operate as the ideological doppelganger of anthropocentrism since it prioritizes one form of existence over another and then marginalizes and dismisses the rest. Environmental mattering does not stop with the animal and the living since the situatedness of these beings always makes them connected to each other and to the environment. As Elizabeth A. Povinelli notes, "Life is not the miracle – the dynamic opposed to the inert of rocky substance. Nonlife is what holds, or should hold for us, the more radical potential. For Nonlife created what it is radically not, Life" (176). In a similar vein, Aldo Leopold also points to the necessity of expanding the subjects of environmental ethics, writing that "the land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land" (204). Leopold's land ethic, drawing attention to the "biotic community," (204) aims to decenter the human and is "as he calls it, the ethics of the Earth" (Torralba et al. 18). On our planet, anthropogenic change affects the waters of an environment and disturbs different species, the "food chains," and the human beings (Neimanis 35). This circular chain of effects may make the human being care for their environment but only as a way to care for the health and wellbeing of one's own species. Thinking beyond a single species can only be achieved if we can move beyond Earth, networks of life, and our relational benefit-driven mindsets – an approach made possible by thinking with outer space stories or transplanetary science fiction.¹⁰

⁹ Francesc Torralba et al. map out biocentric thinking to ascribe all forms of life with "value" and note that in biocentrism, "life is the centre of the universe and is worth preserving in all its forms. Life has moral significance in itself without any discrimination between species" (25).

¹⁰ I am drawing the term transplanetary from the reading group, the Transplanetary Ecologies, organized by Rachel Hill and Makar Tereshin at University College London. Transplanetary science fiction brings expansion into focus in the genre.

The exclusionist approach in environmental thinking that differentiates between life and nonlife makes it antithetical to the purpose it aims to address. This way, one of the devastating consequences of the Anthropocene, geoengineering, is entirely excluded from environmental discussions. The Center for International Environmental Law defines geoengineering as intentional large-scale human activities designed to offset climate change through environmental modifications ("What Is Geoengineering?"). The extensive scale of this phenomenon and the role of the human as the agential figure raise concerns for environmental ethics. As Eric Katz writes, "geoengineering" is one of the "paradigmatic examples of the anthropocentrism of the so-called Age of the Anthropocene;" it demonstrates "the epistemological domination of human thought and meaning imposed on the entire planet" (29). This novella's space mining is a futuristic alternative to contemporary geoengineering. Contrary to Katz's argument, which calls for the reduction of anthropogenic interventions in the environment, the characters' interventions in the icy environment, including their attempts to "mold it into the desired shape" (Asimov 34) for transportation, suggest that inanimate entities do not reside in the paradigm of ethical mattering. Blindness to inorganic matter can be viewed as an extension of "plant blindness" – "the inability to see or notice the plants in one's own environment" – which reinforces the "anthropocentric ranking of plants as inferior to animals" (Wandersee and Schussler 3). Challenging blindness to inorganic matter necessitates cutting loose from the dualistic thinking that does not acknowledge the ethical mattering of inorganic entities. Discussing the rights of Mars and the ethical aspects of planetary engineering, Christopher P. McKay states that it is impossible to examine lifeless objects on Earth in isolation from life; thus, giving rights to inorganic objects is impractical (195). However, narratives of speculative geographies beyond Earth bring this ethical issue into focus. Discussing the ethical aspects of asteroid mining, the ethicist Reed Elizabeth Loder refers to the US Space Act of 2015,¹¹ which avoids "environmental issues in space mining, leaving an ethical cavern"¹² and maintains that "much of environmental ethics is tethered to Earth" (301). She points out that, "life-oriented bias might free space explorers from thinking they are under ethical constraints and encourage an unfettered human-centered attitude" (303). The environment that may not or does not sustain living organisms should have equal ethical value as the environment that does.

6. Conclusion

"The Martian Way" and similar transplanetary stories matter since they highlight our relationship with the environment and illustrate how we are physically and emotionally connected to it. My reading of "The Martian Way" highlighted this interconnectedness through an analysis of the interplay between the traumas experienced by the humans and the environment. Even

¹¹ The Act endows "property rights to private entities and individuals who harvest resources from asteroids or other celestial bodies" (Loder 276).

¹² Some space companies, including "Planetary Resources" and "Deep Space Industries," aim to do "space mining" for water and minerals (Shriya Yarlagadda).

though Asimov's novella is a colonial fantasy of environmental appropriation, by portraying the traumatization of the environment, it indicates that environmental mattering transcends the human, the animal, and the living to include the nonliving as well. All environments, with or without life forms, can be traumatized by anthropogenic change. In "The Martian Way," suffering occurs when material transformation is inflicted on the body of ice. All matter matters, and in this novella, suffering binds the human to the nonliving environment, most notably to the ice. As we realize regarding life on Earth, all matter is linked in an invisible web,¹³ whose appreciation as an interconnected whole benefits all its constituent parts. I therefore extend Jeremy Bentham's questions in the discussion of the rights of animals to the rights of the environment: "The question is not, Can they reason? nor, Can they talk? but, Can they suffer?" (311). Now, the questions we should ask are: Do environments have rights?¹⁴ Can they suffer pain and trauma? My reading of "The Martian Way" responds to these questions by extending mattering to the environment, be it living or nonliving, and by contesting exclusionary perspectives to open up a space for reflection on the traumatization of inorganic matter and environments. Studies of ecotrauma can create further opportunities for scholars to decenter humans and examine the traumatization of the environment through the perspectives of trees, soil, water, and other living and nonliving entities.

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¹³ As suggested, for instance, by James Lovelock's theory of Gaia or the "self-regulating" Earth (31).

¹⁴ As Evans notes "in 2017, New Zealand granted legal personhood to the Whanganui River," and as other countries followed this example, later "all rivers in Bangladesh also received legal rights". This is a positive step that can be extended towards other inorganic elements and environments beyond our planet.

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