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Forms of Duration: Preparedness, the *Mars* Trilogy, and the Management of Climate Change

Abstract This essay examines two kinds of speculative fiction focused on the management of climate change: preparedness documents on climate change as a threat to national security, and Kim Stanley Robinson's *Mars* trilogy (1993–96), a science fiction trilogy about the terraformation and colonization of Mars. Focusing on narrative scenarios and exercises that train officials to respond to natural disasters, this essay positions these preparedness documents as part of a system of affective management. They teach participants to cultivate a feeling of neutral detachment—to stay calm and cool so that they can react automatically and repeatedly when disaster strikes. This emphasis on detachment and repetition reveals the political stakes of preparedness as a national security paradigm: to maintain the status quo by extending the always-catastrophic present into the future. The essay's second half turns to the *Mars* trilogy to argue that by emphasizing duration, or the heterogeneous lasting of time, the trilogy invites its readers to experience climate change as the intersection of various scales and compositions of time, both human and nonhuman. Demonstrating that the management of climate change is inseparable from an experience of it, the *Mars* books challenge preparedness by emphasizing ongoing change rather than the containment of a never-ending series of disasters.

Keywords affect, national security, media studies, temporality, form

In 2014, the United Nations' International Panel on Climate Change (IPCC) published its most forceful Climate Change Assessment Report yet, stating unequivocally that climate change is anthropogenic. The US Department of Defense soon followed suit, publishing its *2014 Climate Change Adaptation Roadmap*, which states that climate change poses "immediate risks to U.S. national security" (2014, 1). But while the IPCC's report emphasizes the mitigation of climate change—stating that "mitigation . . . can substantially reduce

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climate change impacts in the latter decades of the 21st century and beyond" (17–18) and advocating for immediate action to curb carbon emissions worldwide—the Department of Defense document, in contrast, focuses mainly on managing the effects of climate change. It calls for the development of "adaptation methodologies and strategies" that integrate decisions about climate change into national governments' "existing management processes" (US Department of Defense 2014, 8, 9). The report's overall emphasis on using "existing mechanisms" (9) to adapt to or manage the effects of climate change is a serious departure from the IPCC's call to change the behaviors that contribute to it. This emphasis on adaptation or management over mitigation not only reveals the fundamentally conservative orientation of US climate change policy; it also draws our attention to the process of managing climate change itself, or to how US national security documents envision handling what the Department of Homeland Security (2010, vi) has called "a 'new normal' of more frequent disasters."[1]

The term *management* as I use it here connotes a formalization and codification of the process of living on in the present. It's about developing specific methods or protocols for getting on with things, even—or perhaps especially—amid disaster. In what follows, I examine two styles of managing climate change as they are enacted through two different forms of media, national security documents about climate change and Kim Stanley Robinson's *Mars* trilogy (1993–96), a science fiction epic about the terraformation and colonization of Mars. These media forms are obviously quite different—they address different audiences and serve different purposes—but they are both concerned with how to manage climate change through the proper administration of affect. Both, in other words, seek to train their audiences to feel a certain way in response to the catastrophes climate change brings. This kind of affective training is a process of mediation: it describes the felt effect of these various media forms. To that end, I also draw from recent phenomenological work in media studies on how media produce certain sensations. The aim is to consider what kinds of cognitive, emotional, and even physiological experiences these media generate. This essay thus emerges not only from work in affect theory, but also from the resurgence of interest in form in literary studies over the past decade, a new formalism that might in some cases also be called a media theory of literature. The particular form I focus on is narrative, or more specifically, speculative fiction: both kinds of media

are concerned with using narrative to project or simulate future catastrophes. Thinking about speculative fiction as a specific narrative form rather than only as a genre allows us to consider its affordances, or as Caroline Levine (2015, 6) puts it, "the particular constraints and possibilities that different forms afford." Moreover, it allows us to focus not only on what speculative fiction as a form is capable of doing, but also on how it travels from one context—literature—to another—national security documents. Attending to this movement opens up both "*a generalizable understanding of political power*" (7) and an understanding of how this power works differently in different contexts. National security documents and science fiction trilogies may both utilize the specific affordances of speculative fiction to attune their audiences affectively to climate change, but they do so for very different political ends. Understanding speculative fiction as a form that travels across different kinds of media in different cultural contexts draws these political differences into sharper distinction.

The first part of this essay focuses on the articulation of climate change as a national security threat and its incorporation under the rubric of preparedness.[2] Preparedness, a national security paradigm that moved to the center of US policy after September 11, 2001, simulates possible future catastrophes in order to prepare government officials and experts to respond to the eventual emergence of these catastrophes. Because the probability and severity of such events cannot be calculated, preparedness emphasizes institutional readiness and emergency management rather than prevention. Utilizing a variety of techniques—I focus here on narrative scenarios and simulation exercises designed to train officials to respond to natural disasters—preparedness teaches officials and experts to respond to anything from terrorist attacks to hurricanes using the same protocols for response. It emphasizes developing procedures for determining who the first responders on the scene should be, what resources should be sent where, and how to best protect and ensure the continued functioning of vital infrastructure during a disaster.[3] Above all, preparedness stresses the importance of developing protocols for immediate response to disaster: such protocols must be in place so that officials can react quickly and unthinkingly to catastrophe. Correspondingly, the media I detail here seek to cultivate a feeling of ready detachment among their participants. Officials should remain alert at all times, but they should also feel cool and collected, a style of disaster

management that allows them to react immediately and unthinkingly, in real time, when disaster strikes. More than just demonstrating the extension of preparedness into all realms of contemporary life, however, the incorporation of climate change into preparedness programs also evidences the political stakes of preparedness as a national security paradigm. Preparedness media's emphasis on instantaneous response is ineffective or even meaningless when tasked with the management of climate change. How do we respond immediately to disasters that are ongoing, slow moving, and nonlocal?[4] What does "real-time response" entail in this context? Despite these limitations, however, preparedness media cultivates this feeling of always-alert detachment because it is politically expedient. It emphasizes the maintenance of the status quo—the extension of the present into the future, indefinitely—over meaningful change.

Robinson's *Mars* trilogy, the subject of the second part of this essay, offers a different style of disaster management. By emphasizing duration, or the heterogeneous lasting of time, the trilogy invites its readers to experience climate change not as a series of discrete disasters to which we must unthinkingly respond, but rather as the intersection of various scales and compositions of time, both human and nonhuman. In resisting the structure of the sudden catastrophic event, it focuses on climate change—even the catastrophic changes it brings—as the experience of ongoing, intersecting processes that occur both above and below a human level of perception. It demonstrates, in other words, that the successful management of climate change is inseparable from this experience of intersecting human and nonhuman temporalities, using the form of the novel itself to train its readers to feel climate change as these intersections. Managing climate change, for the *Mars* trilogy, does not involve maintaining the status quo; rather, it's about cultivating a feeling for the ongoingness of change, for the different scales at which changes in the climate happen, and for experiences and sensations that are not our own.

Feeling Neutral

One kind of speculative fiction that preparedness media employs to manage climate change is the disaster scenario. These scenarios are narratives that attempt to imagine the kinds of catastrophic changes

global warming will bring, and they often provide the backdrop to training exercises in which participants simulate—through enactment, discussion, or a combination of both—their responses to these catastrophes. In 2003, the Department of Defense commissioned futurologists Peter Schwartz and Doug Randall to produce such a scenario to illustrate the possible long-term effects of climate change. Schwartz and Randall were hoping to draw public attention to the issue, and they focused on the most ominous projections of the latest climate models at the time. The document they produced, titled "An Abrupt Climate Scenario and Its Implications for United States National Security" (2003), describes the rapid collapse of the ocean's circulation system due to melting ice sheets and a corresponding rapid shift in global temperatures over the course of just one decade, from 2010 to 2020. This shift entails "cooler temperatures in Europe and throughout much of the Northern Hemisphere and a dramatic drop in rainfall in many key agricultural and populated areas," while the Southern Hemisphere experiences "increased warmth, precipitation, and storms" (10). These dramatic shifts cause "catastrophic shortages of water and energy supply" and lead to "violence and disruption" across the globe (14). "Disruption and conflict," the authors warn, "will be endemic features of life" (22).

What is most interesting about this now much-lampooned scenario is not that it's implausible or hyperbolic, but rather that it evidences the limitations of the scenario form itself when tasked with managing climate change. The scenario form, created and popularized during the Cold War to train officials to respond to discrete catastrophes like nuclear attacks, works best when tasked with handling specific events.[5] The disasters scenarios routinely depict arrive suddenly and without warning, disrupting the fabric of everyday life: the terrorist attack, the superbug, the tsunami. In order for the scenario form to effectively manage climate change, climate change has to be given the structure of an event. The ocean's circulation system, for example, has to suddenly collapse. This kind of abstraction—this specific form of disaster management—depicts present, already ongoing systemic crises as future catastrophic events with discrete beginnings and endings. It attempts to manage ongoing disaster by shaping it into modular chunks to which officials must respond over and over, into perpetuity. But the disaster Schwartz and Randall describe doesn't exactly fit this familiar form. The decade the scenario attempts to encompass,

although quite short in terms of climatological timescales, is far too long for the scenario form to effectively handle. Schwartz and Randall are at a loss to describe any long-term implications of the global temperature shifts they describe, even though this is the explicit purpose of the scenario. "Perhaps the most frustrating challenge abrupt climate change will pose," they write, "is that we'll never know how far we are into the climate change scenario and how many more years—10, 100, 1000—remain before some kind of return to warmer conditions" (19). The admission that "we'll never know how far we are into the climate change scenario" emphasizes the scenario's own inability to arrive at any kind of resolution. In order to make sense as a scenario, Schwartz and Randall's narrative needs to impose the familiar form of sudden catastrophe; however, it has to impose this form onto a particular kind of becoming—climate change—for which it is difficult to ascertain a beginning or an ending.

This failure of the scenario form to effectively deal with climate change demonstrates that preparedness is not equipped to deal with catastrophes that are fundamentally nonspectacular—those that are slow moving, long in the making, and nonlocal. This failure also evidences the problems with the timeframe within which preparedness is designed to be effective. Although preparedness may seem to center on possible future threats, it is in fact relentlessly focused on the present. Preparedness works not by controlling the emergence of the future to ensure that a catastrophic event does not happen, but rather by proliferating many possible "futures" by making them present. It creates alternative presents, or fictions, disguised as possible futures, as if the catastrophes they describe haven't happened just yet, but will any day now.[6] Eric Cazdyn (2012, 7–8) calls this temporal mode "the new chronic," emphasizing how it "extends the present into the future, burying in the process the force of the terminal, making it seem as if the present will never end." Preparedness emphasizes, in other words, the continual maintenance of the status quo, perpetually managing "an undying present" (5) rather than confronting its end. Even though scenarios like Schwartz and Randall's emphasize the "eventilization" (Berlant 2008, 6) of climate change, the scenario's inability to effectively end or to imagine a future beyond the disaster it describes also evidences the extent to which preparedness is invested in the present—or, perhaps better put, in the fabrication of many different presents, each one a fresh disaster. Disaster is produced

anew again and again, and so we must handle it again and again, over and over.

More recent documents like the Department of Homeland Security's 2012 *Climate Change Adaptation Roadmap* also emphasize this idea of preparedness as an iterative process of continual crisis management. Words like "adaptation," "sustainability," and "resilience" are repeated several times in this document, drawing our attention to the ongoing adjustments we must continually make to manage climate change. We must develop "resilience to disasters;" we need to adjust "to a new or changing environment" in such a way that "exploits beneficial opportunities or moderates negative effects"; we should "create and maintain conditions under which humans and nature can exist in productive harmony that permit fulfilling the social, economic, and other requirements of present and future generations" (iv, 5). The emphasis is everywhere on maintaining the supposedly current "productive harmony" of the "natural" world, on maintaining the current status quo in which some people in some places can enjoy, seemingly forever, such "productive harmony." For national security documents, managing climate change is about containing disaster, over and over, so as to resist change. In order to continue to manage climate change, these documents tell us, we just need to sustain ourselves, to keep on keeping on, to make sure everything stays the same.[7]

Words like *adaptation*, *sustainability*, and *resilience* also imply a specific system of affective management: one centered on mitigating fear and maintaining an even keel at all times. Materials developed by the Exercise Management Institute of the Federal Emergency Management Agency (FEMA) on designing and facilitating the training exercises for which scenarios like Schwartz and Randall's might be used emphasize this affective mode (FEMA 2003).[8] These materials are more general than the other documents described in this section, as they are meant to instruct officials in how to design and facilitate training exercises for any kind of catastrophic event. But this is also precisely the point: under preparedness, climate change becomes generalizable; it becomes just another catastrophe, or series of catastrophes, to which we need to respond. The idea is that the same training and affective management techniques can apply to pandemics, terrorist attacks, or natural disasters. Brian Massumi (2005) has emphasized the affective effect of this kind of generalization. He contends that preparedness media manage fear of the future threat through

abstraction, or by virtualizing and autonomizing fear so that it can "operate as the nonphenomenal background of existence" (44), training people to respond to potential threats, whatever they are, without feeling.

The FEMA Exercise Management Institute documents seem at first glance to promote something similar because they continually emphasize the need for exercise facilitators to keep participants calm. However, their persistent attention to how to cultivate this feeling of calm reveals that these exercises are designed not to train participants not to feel, but rather to train them to maintain a feeling of neutrality. This neutral feeling is a carefully constructed affective experience: it's not a lack of feeling so much as it's the median of excitation and boredom. For example, these materials recommend that, since the narrative portion of the exercise, or the scenario, "*sets the mood*" and "captures [participants'] attention and makes them want to go on," the scenario should be "written in short sentences that lend immediacy and tension," and it should "devote more detail to the environment of the emergency . . . to create intensity of feeling" (FEMA 2003, 4.25). Additionally, if the exercise designers have done their job well, the atmosphere during a training exercise should be "stressful and tense due to real-time action and the realism of the problems" (6.2). It is also important that facilitators and participants not allow themselves to be carried away by this emotional intensity, however. The exercise facilitator should seek to avoid conflicts that can arise when participants are pushed out of their comfort zones. "People may come with fragile egos and little exercise experience," the exercise materials warn. "If you see mounting frustration or conflict, stop the exercise. Reach into your experience as a discussion leader to help the players resolve conflicts and feel comfortable" (5.7). Those participating in the exercise should feel "at ease" at all times (5.5). But again, they should not feel so comfortable that they become bored, as "one inactive organization [or group of participants] can distract others and bring down the intensity of the exercise" (6.14). FEMA's paradoxical exhortations to both excite participants and put them at ease shows how the feeling of neutrality these media inculcate is akin to what Sianne Ngai (2005) calls *stuplimity*. This term, which unites agitation with boredom, aptly describes how this media brings together "sharp, sudden excitation and prolonged desensitization, exhaustion, or fatigue" (271). FEMA's Exercise Management Institute materials

encourage exercise facilitators to employ a variety of strategies to modulate this feeling among participants, never allowing them to remain for too long at either end of the spectrum. Training exercises should be exciting, but also comforting (but not *too* comforting).

As it is deployed in preparedness media, this kind of stuplimity resists change. Like Schwartz and Randall's climate change scenario, the FEMA materials instruct participants in how to maintain the status quo—in how to extend the undying present—by reacting immediately and mechanically to catastrophe. Additionally, climate security documents like the Department of Homeland Security's 2010 *Climate Change Adaptation Report* and the Department of Defense's 2014 *Climate Change Adaptation Roadmap* focus on the importance of developing "a robust national response capability" that will allow the United States "to adapt to changing conditions and prepare for, withstand, and rapidly recover from disruption" (US Department of Homeland Security 2010, 2, 1). Officials need to develop "adaptive responses" that will allow them to quickly react "in the face of a rapidly changing strategic setting" (US Department of Defense 2014, 12, 1). These documents stress the importance of immediate response capabilities, proving the extent to which, as Ngai writes, stuplimity inspires "repetitive and often mechanical acts of enumeration, permutation and combination, and taxonomic classification" (36). When disaster strikes, personnel should simply and immediately be able to follow protocol without having to pause to consider what they should do. Nor should they feel too strongly about it all: there is simply no time to feel traumatized or shocked or stymied by catastrophe, and these feelings are not adaptive, sustainable, or resilient. Preparedness media encourages this kind of cool detachment, a feeling Alan Liu (2004, 238, 232) has described as a "constrained" "*automatic* feeling," as "so diminished an experience."[9] Officials need to react now to catastrophe, to spring immediately into action—but importantly, they need to remain calm so they can automatically do the same thing again and again and again. They should respond in real time to perpetual catastrophe, unflinching and unblinking, over and over again.

Feeling Climate Change

Kim Stanley Robinson's *Mars* trilogy encourages rather more expansive sensations by training its readers to feel climate change itself.

This statement may seem strange or even wrong: we can't "feel" climate change, after all. Even when we step outside into an unseasonably dry December, for example, Timothy Morton (2013, 48) reminds us that "we are never directly experiencing global warming as such" because we cannot directly experience climate, a phenomenon "massively distributed in time and space." However, as Morton makes clear, we can experience climate through mediation and abstraction, through things like climate models. And as Jesse Oak Taylor (2013, 3, 4) argues, novels can function like computer models of climate in that they "perform the experience of the climatic encounter"; instead of representing a particular climate, they enact it, allowing their readers to experience "climate *as* climate—which is a contradiction in terms *except* in and through such models." As a simulation of a changing climate, the *Mars* trilogy generates an experience of climate as climate—a "climatic phenomenology," as Taylor puts it (4)—that is bound up not in its representations of the Martian climate, but rather in the temporal experiences the trilogy mediates. It opens up its readers' consciousness of time to the many different nonhuman temporalities through which changes in the climate happen, placing us in contact with temporalities we can't experience directly.

This opening up to different temporal experiences constitutes an alternative mode of managing climate change. Taylor uses Charles Dickens's *Bleak House* (1853) to make his argument about the novel as climate model, but understanding novels as models or simulations of other realities is a more common way of thinking about novelistic form in science fiction studies.[10] And as Fredric Jameson (2005, 232) argues, the speculative impulse behind this understanding of novelistic form is explicitly political: science fiction, especially its more utopian forms, like the *Mars* trilogy, is "the answer to the universal ideological conviction that no alternative is possible, that there is no alternative to the system." It allows us "to think the break" (232) between its world and ours in order to stave off what Colin Milburn (2012, 67, 87) terms "the metastasis of the present" that we see in preparedness media. Through its attunement to heterogeneous experiences of time, the *Mars* trilogy demonstrates that in order to effectively manage climate change, we need to experience its ongoingness.

One scene from the middle of *Blue Mars* nicely illustrates this idea. Sax, one of the first scientist-settlers on Mars, has been producing models of the rapidly changing Martian climate as the planet becomes

more habitable. Although the different models of Martian weather Sax produces fail to predict emergent weather patterns, he expects this result; indeed, Sax is "aware that their match with reality was approximate at best" and that "the future of our climate was impossible to predict" (*B* 413).[11] Yet, Sax calls these models "fascinating"—he says "he could watch the iterations play out all day long"—precisely because they are not representations of present or future reality (414). Like the catastrophes disaster scenarios produce, they are fictional worlds unto themselves: "Over and over Sax watched a thousand years of weather, altering variables in the models, and every time a completely different millennium flitted past" (414). They generate an experience, not necessarily of actual future Martian climates, but rather of the changing climate itself. Sax watches "a thousand years of weather" unfold on his computer screen "all day long," bringing the long geological timescales of climate change into contact with the infinitesimally shorter timescales of the millions and millions of calculations his computer makes as it simulates the weather, all of which also come into contact with Sax's lived experience of one day and with our lived experience of reading the novel. These various timescales are not reducible to human perceptions of time, yet this scene shows how these fundamentally nonhuman temporalities intersect our own. The *Mars* trilogy demonstrates that to experience climate as such is to experience these heterogeneous intersections of time.

The kind of management this scene depicts, one that trains us to experience climate change through mediation, is connected to the trilogy's investment in duration. I will discuss how the *Mars* trilogy provides an experience of duration in more detail below, but first let me explain what I mean by the word *duration*. One way to think about duration in connection to the trilogy is as a formal feature, as length. The *Mars* trilogy is long, stretching to nearly two thousand pages in its paperback editions. The trilogy's length can be measured in different increments: in pages; in how long it takes to read it; in the two hundred or so (Earth) years it depicts; in the years that separate the publication of *Red Mars* in 1993, *Green Mars* in 1994, and *Blue Mars* in 1996.[12] The renewed attention to form in literary studies, however, offers a way of thinking about the trilogy's extended length as more than a description of its novelistic form—it helps us see how length is also important to the experience of time the trilogy's form makes possible. W. J. T. Mitchell (2003, 322, 324), for example, describes the

notion of form to which he is "committed" not as "the *manner* in which something is done, a way of getting from here to there," but rather as "a way of being in the path." Cary Wolfe (2009) echoes this understanding of form as an ongoing process—the process that is the path itself, to use Mitchell's metaphor. Wolfe describes form as "a *movement* of observation whose engine is *double*" (273), and the important point for our purposes is Wolfe's conception of form as a movement or process, as something that "takes *time*" (273).[13] This temporal understanding of form, while certainly not restricted to novels, does help us see the importance of length as a formal feature especially pertinent to novels. A novel takes time to read, and as we read it, the temporalities of the novel's narrative intersect with our own, lived time. "Novels," Sue Zemka (2012, 9) writes, are "a remarkable cultural practice *in* duration," not only because they are long, but also because they "are generically programmed to cultivate their reader's experience of speed and slowness." To read a novel is to experience the intersection of various timescales: novels take time in this literal sense.

This experience of intersecting timescales is also how Henri Bergson understood duration. For Bergson ([1910] 2001, 229), duration constitutes not just an experience of a length of time, but also of the "absolute heterogeneity" of time. It involves not the succession of time, the following of one moment after another, but rather the interpenetration of past, present, and future, a grasping of "our inner states as living things, constantly *becoming*" (231). It is "a succession of qualitative changes, which melt into and permeate one another, without precise outlines, without any tendency to externalize themselves in relation to one another" (104). Duration is an experience of the continual changing of time that is also, paradoxically, an experience of the lasting of time, of how time stretches on. It is this heterogeneity of time that I want to hold on to here, and my claim is that the *Mars* trilogy's sheer length provides an experience of duration in this sense. Through the movement of its form—through the time the novels take—the trilogy opens up to continually changing permeations of time.

Yet there is a major problem with Bergson's conception of duration, as N. Katherine Hayles (2012, 86) has pointed out: for Bergson, "there remains a qualitative distinction between the human capacity to grasp duration and the relations of objects to it." Although objects, like humans, exist within duration—"the universe *endures*," as Bergson ([1911] 1998, 111) puts it—objects cannot experience duration. Only

humans have the ability to experience duration, because this experience is tied exclusively to intuition or "deep introspection," a capacity for conscious, self-aware experience that is also a philosophical method for Bergson ([1910] 2001, 231). However, one of the main points I am making about the *Mars* trilogy is that it is *not* just concerned with a human experience of time. The temporalities that intersect with the "lived" time of the *Mars* trilogy's characters and readers are nonhuman: Sax, remember, watches thousands of years of weather flit past his screen as the long timescales of geology and climatology intersect with the much shorter timescales of digital computing. Robinson's *Mars* trilogy brings us into contact with temporalities that lie outside of our human experience of time, temporalities that are inaccessible to us and that we can only access through media like the trilogy.

What do we do, then, with Bergson's rather musty idea of duration, an idea that by now is surely simply out of date? The key may be to move from Bergson's conception of intuition as an inner experience of self-awareness toward something closer to Berlant's (2011, 52) conception of intuition, which she calls "a trained thing" or a style of management. Mark B. N. Hansen's work on the technicity of time and of human time-consciousness is instructive in this regard. Hansen (2009, 297) argues that time exists only in and through its various abstract "temporalizations" by different media, media that are independent of lived human experiences of time; as he puts it, "there simply is no time-in-itself." What's more, these temporalizations actually generate what he calls the "fundamental heterogeneity" of time (297). Whereas for Bergson, the heterogeneity of time has to do with the lived permeations of past, present, and future that constitute the inner (human) experience of duration, for Hansen, the heterogeneity of time is "the recognition of time's essential unboundedness in relation to human experience (or any other concrete temporalization)" (307), a recognition, importantly, that is produced by and through various media. The heterogeneity of time involves an opening up to those temporalities that humans cannot experience, but those with which we nevertheless interact when we conceptualize and experience time through media. Hansen shows us how to consider the heterogeneity of time that Bergson identifies as fundamental to duration as a heterogeneity of different speeds and compositions of time, both human and nonhuman. He also emphasizes that recognizing this heterogeneity of

time involves a particular kind of training, a particular mode of learning to manage our own experiences.

This is the kind of training that the *Mars* trilogy provides, and it does so through its numerous references to its own novelistic form. The scene about Sax and his climate models that opens this section is one such example. As Sax watches thousands of years of Martian weather flit past his screen all day long, he experiences duration as the fundamental heterogeneity of time—the experience I am arguing the *Mars* trilogy itself generates. This scene, in other words, is a metonym or model for the trilogy's form as a whole: it emphasizes duration as the intersection of different human and nonhuman temporalities, temporalities that are irreducible to the human consciousness of time but that intersect with and co-constitute this consciousness itself.[14]

One metonym for the trilogy's form that recurs throughout involves the long descriptions of the Martian landscape. Robinson includes copious description throughout the books: as Jameson (2005, 393) writes, the trilogy is composed of "pages upon pages" on "pocket disquisitions on a host of topics," ranging from "the biochemistry of rocks and solids," to "genetically engineered micro-organisms and genetically reconstructed DNA," to "'string theory' and the unified field theory in physics." But Robinson perhaps spends the most time discussing the Martian landscape. We read one of the trilogy's first descriptions of this landscape when the First Hundred, the initial group of scientist-settlers to arrive on Mars, reach the planet and see its surface from their spacecraft the *Ares*, a passage worth quoting at length:

> The depth of Valles Marineris was perceptible, the height of the four big volcanoes obvious: their broad peaks appeared over the horizon well before the surrounding countryside came into view. There were craters everywhere on the surface. Their round interiors were a vivid sandy orange, a slightly lighter color than the surrounding countryside. Dust, presumably. The short ragged curved mountain ranges were darker than the surrounding countryside, a rust color broken by black shadows. But both the light and dark colors were just a shade away from the omnipresent rusty-orangish-red, which was the color of every peak, crater, canyon, dune, and even the curved slice of the dust-filled atmosphere, visible high above the bright curve of the planet. Red Mars! It was transfixing, mesmerizing. Everyone felt it. (*R* 84)

This description of the planet's surface occurs at an interstitial moment in the plot of *Red Mars*, just after the First Hundred have endured the drama of entry into Martian orbit—"a roaring, shuddering, breath-robbing eight minutes" (83)—yet well before they will land on the surface (it will take another few weeks before the first landing crew touches down). As the passage itself as well as its placement within the narrative suggests, the detail that Robinson devotes to descriptions of the planet often feels "transfixing" or "mesmerizing" in that such descriptions seem to stop narrative progression. Robinson's prose in these passages dilates on aspects of the Martian landscape and does nothing to forward the plot. Amy King (2011, 163) argues that such "dilatory descriptions" not only pause narrative time—they also "prompt us to consider . . . the pleasures of pause" itself. Indeed, the stillness that pervades Robinson's descriptions of Mars invites us to linger over his luxurious prose. We are ourselves transfixed: "everyone felt it."[15]

The novel's descriptions of the Martian landscape not only feel transfixing; the landscape itself is often described as unmoving, frozen in time, "still as death" (*B* 97). As Ann—a geologist and a member of the First Hundred—notes, variations in climate or the processes of erosion or tectonic action have changed landscapes on Earth many times, "everything torn away and rebuilt scores of times as the eons passed, and always flattened by weather and biota" (*G* 119). But the Martian landscape, rust red and full of "undulations everywhere, a continuous up-and-downing of hummocks and hollows, ridges of cracking bedrock, hollows of fine drifts, great rumpled boulder fields, isolated tors and little sinkholes," "had not changed for a billion years" (119). Martian time is slow time and the evidence of this slowness, this geologic and nonhuman pace of change, is written on the landscape.[16] This landscape, which Ann "read[s] . . . like a text, written by its own long past," is both a record of its history and this history itself (*B* 97). Just like the trilogy, which is simultaneously an enactment of the past as it becomes the present (as we read, the trilogy's present comes into being) and a record of this enactment (the novels work as storage media in which we can keep the history they relate for future access), the Martian landscape bears its long past with it.[17] The descriptions of the landscape's layers upon layers of dust emphasize how the planet and the novelistic form it references function as

records of both human and nonhuman history, or of the intersections of different rates and compositions of time.

But even though these descriptions of the Martian landscape seem to pause time, they are also about the continual, albeit slow, passage of time. The transfixing description of Mars's surface as seen from the *Ares* that is referenced above, for example, occurs while the ship is orbiting Mars at thousands of kilometers per hour. The view the people on board have of the Martian surface is only possible because they are quickly moving over it; even this moment of pause contains ceaseless movement. Similarly, the trilogy's spatialization of time within the Martian landscape does not freeze time. The slow processes of wind and erosion are continuously working on Mars to shape and shift the planet into new formations, as they have for billions of years. These landscapes escape fixation, slipping away from their own representations even though they appear fixed. One of the many places this occurs is in *Green Mars* during Ann's explorations of the dunes of the northern plains. She studies "the garnet sand dunes, and their layering, which revealed the old climates like tree rings" (*G* 121). However, she also notes that "snow and high winds were tearing off the crests of the dunes," causing them to "[pick] up the pace of their slow march around the world" and destroying "the record they had made of earlier ages" (121). The landscape is continually moving and slipping away in this passage, even though Ann perceives it as resolutely static. Time keeps moving, slowly, on.

If we read these descriptions of the Martian landscape as metonyms for novelistic form, we can see how the trilogy uses these passages to account for duration as an experience of the heterogeneity of time. Ann's "rock ethic," or her belief in an "intrinsic worth for the mineral reality of Mars," is born from precisely this recognition of "the immense slow life of geophysics," or the nonhuman temporality of Mars as a planet (*G* 145, *B* 97). This ethic—and the descriptions of the Martian landscape through which it is enacted—constitute an engagement with slow processes of change and an insistence on the unchanging fact of change itself, no matter how slow. The Martian landscape continues to last through time; it endures. But this endurance, this elongation in and of time, also involves continual change, change that is not reducible to a human consciousness of time. Ann's rock ethic seems alien to others in the trilogy not only because it involves the seemingly paradoxical notion of "ecology without life,"

but also because such a notion only makes sense if one considers the geological timescales at which this ecology operates (*G* 145). Even Ann herself has trouble thinking on this timescale: she "fought to see nothing but rock, to think like a stone" (*G* 125). Humans cannot directly experience such temporalities as they last and last over billions of years. Yet the *Mars* trilogy mediates these alien temporalities for us, bringing us into contact with them indirectly. The highly self-aware trilogy even references this act of connection itself. In *Green Mars*, Ann wanders throughout the vanishing areas of the planet that remain resistant to terraforming, mourning the loss of the mineral, alien Mars she once knew. In one scene, she handles rocks from a boulder field, each of which has been scraped flat by the Martian wind on one exposed surface. She "think[s] about how many years their planed sides represented, wondering whether her mind might not reveal similar scourings, big sections worn flat by time" (*G* 126). Here Ann compares her mind to the rocks she holds, a moment of metaphorical becoming-rock that also emphasizes the work this metaphor itself must do to bring human and geological lengths of time into contact. Metaphor, a specific form of relation that, as its name tells us, transports us or carries us across, works here to bridge the divide between human and rock time, if only momentarily. Rock time, inaccessible to Ann and to us as readers, can only be experienced through the mediation of this metaphor. It provides a form through which a human temporality can come into contact with a nonhuman temporality; the metaphor is this experience of the fundamental heterogeneity of time.[18]

If the trilogy's Martian landscapes bring human temporalities into contact with the unhumanly slow time of geology, the memory treatment plot that ends *Blue Mars* does something like the opposite, bringing the lived time of a human life into contact with the unhumanly fast time of digital computing. This plot describes Sax's eventually successful efforts to restore the memories of the surviving members of the First Hundred. Due to the longevity treatment developed in *Red Mars*, this group of people has lived so long—well over two hundred years by this point—that they can no longer remember their own lives. We may be tempted to read the memory treatment plot as a metaphor for the process we as readers must endure to make sense of the trilogy after reading nearly two thousand pages. After all, Sax describes the widespread loss of memory among this group of people

as "the death of story" (*B* 644), suggesting that the restoration of memory would allow for the synthesis of past, present, and future—of the trilogy's many bundled plots and fractured timelines—and the restoration of the normal progression of narrative.[19] However, this is not what happens when Sax actually undergoes the memory treatment. Instead of a resurrection of story, or of the human temporality of narrative, we see the sudden flowering of a networked temporality that connects disparate moments in time virtually simultaneously. After Sax completes the treatment, he can "all of a sudden . . . remember *everything*" (*B* 703). His memories form "node[s] in timespace," each one "vibrating a whole network of days" (*B* 703). In the paragraphs that follow Sax's treatment, we join his memory as it leaps quickly from one thing to the next: he remembers how "Nadia had fixed a lot of things" in the beginning of their time on Mars, and how she "had been so pained when Tatiana Durova was killed by a falling crane," and how he and Tatiana "had gone out on a hike in Antarctica during their year there," and how Phyllis was jealous "of Tatiana's great dark beauty," and how "he had been cut from the seventh-grade basketball team" (*B* 703, 704). We as readers remember some of these things from earlier in the trilogy, but some we never knew at all. Through the movement of these paragraphs in and out of Sax's consciousness, we see how his memory travels from node to node. Instead of a story, we glimpse a bundled network; instead of synthesis, a sudden spreading of the trilogy's universe in a million different directions.

Like the metaphor that links Ann's mind and Martian rocks, the form in which Sax's network of memories is related to us suggests the limits of our experience of time. The paragraphs that describe these memories are densely packed, containing very little dialogue and stretching on for pages. They form dense blocks of text on the page, blocks packed with memories that are all occurring simultaneously for Sax—he likens the experience to a "big bang" (*B* 705)—but that take us some time to read. How this scene pushes up against the limits of narrative representation itself suggests contact with temporalities that remain beyond the human experience of time. The narrative can't keep up with Sax's experiences in this moment, nor can we read these pages as quickly as Sax experiences them. What's more, Sax himself can't keep up with the speed at which his own memory is traveling: "What had he been trying to recall?," he thinks; "The rush of thought was so dense and rapid he would not be able to remember

some of this remembering, he was pretty sure" (*B* 704–5). The necessary incompleteness of Sax's experiences of this networked temporality gestures toward our own necessarily incomplete experience of the trilogy, toward the inability of the trilogy to really "last." As Caroline Levine (2009, 522) writes in her assessment of Dickens's *Bleak House* as a novel with a networked form, "since networks expand indefinitely, the networked novel must hint at an immeasurable duration that extends even beyond its own considerable size." In Dickens's attempt to understand social interconnection as a network, Levine shows how he "gestures to the very fact that relations constantly break the boundaries of representation" and "points us to a model of social interconnection that is larger and longer than the novel itself could ever manage" (522). Similarly, the *Mars* trilogy uses the dense paragraphs that describe Sax's experience of the memory treatment to gesture toward the immeasurability of that which it tries to capture, to the fact that Sax's memories—and by extension, his life, the world of the trilogy, the many other timescales at which things happen in the trilogy—stretch indefinitely beyond anything that even two thousand pages can handle. As a metonym for the trilogy's form, this scene suggests the necessary incompleteness of an experience of duration, the inability to directly access those temporalities that remain irreducible to the human experience of time.

■ ■ ■

What does a changing climate feel like? Of course, the answer is both that it feels like nothing—you can't directly experience the many different processes and factors that are changing the climate, after all—and that we feel it every day—our changing climate is everywhere; no matter where you are, there it is. Another answer to this question, the one the *Mars* trilogy provides, is that to experience a changing climate is to experience the intersection of various human and nonhuman temporalities. It is an experience of uneven and inaccessible time, of temporalities that occur beyond the thresholds of our perception, of changes we can't see or directly experience but that nevertheless directly affect us. The *Mars* trilogy orients us toward a paradoxical notion of the ever-changing lasting of time, and of time's irreducibility to human experience and consciousness. It provides an experience of being strangely out of time, even though we are also in it, and it is in us.

The *Mars* trilogy is in this way a challenge to the kind of climate change management preparedness media emphasizes. While preparedness media trains its audiences to remain detached so that they can react immediately, the *Mars* trilogy emphasizes an experience of climate change as an ongoing process. The stuplimity inculcated by training exercises gives way in the *Mars* trilogy to a form that encourages continual affective engagement—or perhaps the better phrase here is continual phenomenological engagement—with the perpetually catastrophic present. Although Mars and the people on it undergo many dramatic, even catastrophic, changes throughout the trilogy, these changes are not given the structure of an event, as they are in preparedness media.[20] Instead, we as readers are invited through the form of the novel to experience these changes as part of the heterogeneous intersections of time that compose a changing climate. In fact, the trilogy seems to suggest that one of the things novels can do in the face of a changing climate is precisely this: they can bring us into contact with climate change as a lived experience. Such an experience encompasses not just the warming weather and the rising sea and all of the disasters associated with these changes, but also the long and the short time scales involved in a changing climate—how it continues on, "after" these disasters, and just keeps going. It involves different rates of change, or the duration of climate change, something I have been arguing we can only experience through the trilogy's novelistic form. The *Mars* trilogy provides a model of how to effectively manage these processes of change as ongoing rather than as discrete disasters that we must continually contain, over and over again. It shows us how to keep living on amid catastrophe, and, more importantly, how we might continue to experience the break between our world as it is and the different worlds to come.

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Notes

1 Lauren Berlant (2011, 10) calls this "crisis ordinariness."

2 One of the first articulations of climate change as a national security threat was Al Gore's (1989) address to the Forum on Global Climate and Our Common Future, which met in Washington, DC, on May 1, 1989. For more on the history of climate change as a national security threat, see Edwards (2006) and Masco (2010).

3 For more on preparedness as a national security paradigm, see Anderson (2010a), de Goede and Randalls (2009), Lakoff (2007), and Lakoff and Collier (2010).

4 See Nixon (2011) for more on the challenges of representing slow-moving disasters like climate change.

5 For more on the scenario form, see McClanahan (2009) and Davis (2007).

6 See Ben Anderson (2010b). Anderson is working from Richard Grusin (2010), who calls this *premediation*. Premediation is a process of mediation that involves "the proliferation of competing and often contradictory future scenarios" "as virtualities" that "have a reality in the present, a force in the present, no matter how the future might turn out" (46, 61). See also *Speculate This!* by uncertain commons (2013), who define the more general processes of speculation on which preparedness depends as "a modern apparatus for erasing the future by realizing it as eternal present" (Kindle locations 69–70).

7 Stacy Alaimo (2012, 559) defines sustainability in a similar way, describing it as the belief in our "ability to somehow keep things going despite the economic and environmental crises that, we fear, may render this impossible."

8 Tracy Davis (2007) emphasizes the performative aspects of exercises like the ones the FEMA materials describe in her book on civil defense training exercises during the Cold War, *Stages of Emergency*. The overlap between civil defense and preparedness is illuminating, especially in relation to both national security paradigms' emphasis on the simulation and enactment of possible threats. However, I am less interested here in performance or enactment in itself than I am in the management of affect, or in how these exercises, whatever their contents, are explicitly designed to produce certain felt sensations. This is what the FEMA Exercise Management Institute materials describe. The specific handbook I reference here was "retired" from active use by FEMA in April 2015 while I was revising this article. It is now available online as a bundled PDF and as a Kindle book (published in 2011) for use by private organizations.

9 Liu (2004, 235) also describes cool, like stuplimity, as "an emotional state so torn between incitements and proscriptions to passion that it is oxymoronic."

10 Robert Markley (2005, 361), for example, emphasizes that the *Mars* trilogy "can be read as simulations that paradoxically remain open to stochastic self-organization." For Markley, the *Mars* trilogy "blurs distinctions between fictional and scientific simulations of terraforming" (362). See Milburn (2012) for more on science fiction novels as simulations of alternative worlds.

11 The novels of the *Mars* trilogy are *Red Mars*, *Green Mars*, and *Blue Mars*. These texts are cited parenthetically here and in what follows using the abbreviations *R*, *G*, and *B*.

12 The difficulty of uniformly measuring narrative length is one of the problems Gérard Genette ([1979] 2002, 29) identified with his definition of duration as "a uniform projection of historical time on narrative extension, that is, number of pages per duration of event." This understanding of duration is a bit awkward, Genette admits, because reading times among individuals vary, and because the number of pages devoted to describing an event varies among editions.

13 Michele Speitz (2014, 185) also draws attention to the importance of movement and process in Mitchell's and Wolfe's conceptions of form, emphasizing "the paradoxical movement of form" and "the broad network of movements, histories, and labors that inhabit form."

14 Amit Yahav (2013) traces a similar understanding of duration, especially in its experiential dimensions, back to eighteenth-century England. She also argues that duration has important implications for novelistic form.

15 Eric Otto (2012, 11, 12, 14) connects this "*sense of wonder*" or the "affective experience of the marvelous" to what he calls the *Mars* trilogy's "*ethics of ecological difference*." This ethics emerges "by juxtaposing human-created and nonhuman wonders," asking us to consider our human activities as marvelous as "nonhuman" nature.

16 Robinson's Martian landscape here seems to embody the very definition of Bakhtin's (1981, 84) *chronotope*, or that "formally constitutive category of literature" that "expresses the inseparability of time and space." The landscape demonstrates what Bakhtin refers to as the "thickening" of time, or how it "takes on flesh" and becomes "artistically visible," as well as how space becomes "charged and responsive to the movements of time, plot and history" (84).

17 Chris Pak (2014, 97) emphasizes that Robinson also draws attention through his descriptions of the Martian landscape to the intellectual history of Mars, or to "the Martian megatext, that compost library constructed in part by science and sf and in part by older forms of knowledge about Mars." For Pak, "the Martian landscape is in part a palimpsest written upon by physical and intellectual landscaping processes."

18 As Caroline Levine (2006, 650) emphasizes, determining the politics of a metaphor means realizing metaphor "is not [just] a poetic response . . . nor does it function as an expression of the views of particular political groups

or imperatives. It is, precisely, another form," one that "carries a unifying force" but that nevertheless "does not have the power to divest the cultural forms it invokes of their difference; it cannot literally collapse them into one." She emphasizes that "the different forms joined by the metaphor do not easily come together in an orderly and directed fashion" (650).

19 Kenneth Knoespel (2012, 113, 112) describes how Robinson "bundl[es] plots over an extended period of time" in the *Mars* trilogy, asking readers to "assembl[e] and disassembl[e] an extensive spectrum of planes that might be compared to the nonsequential phenomenological crossings described by Gilles Deleuze in *What Is Philosophy?*."

20 See Adam Trexler and Adeline Johns-Putra (2011, 191) for more on the *Mars* trilogy's concern for process, especially how it depicts utopia "in the process of being achieved."

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