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Disturbing the Ecocritical Universe: Urban Ecosystems and Ecosublimity in “Prufrock”

A Rapidly-Changing Environment: Ecocriticism from Walden to Prufrock

By Kyle Whitaker

In terms of literary theories, ecocriticism is relatively new to the scene. The term itself first originated in the late 1970s, at a time when an increasing awareness of environmental issues coincided with a renewed interest in what Peter Barry calls “ecocentered” writing, featuring nineteenth century authors such as Ralph Waldo Emerson, Margaret Fuller, and Henry David Thoreau (240-241). Cheryll Glotfelty is typically credited with naming and founding the critical approach, giving birth to a field that she defines as “the study of the relationship between literature and the physical environment” (qtd. in Barry 239). Many of the early Transcendentalists seemed to be interested in this relationship, encouraging readers to actively strengthen their awareness of the natural world around them by immersing themselves in nature. Glotfelty and the other theorists who helped to develop ecocriticism took this passion for the environment and attempted to create a lens through which the modern situation of environmental change could be viewed. A key difference separating this new field from its forerunners was its assertion that nature exists independently of human construction. In other words, ecocritics sought, and continue to seek, to reject the notion that the natural world is a product of social and linguistic construction; doing so allows ecocriticism to encounter the environment from a much less anthropocentric perspective. This view also prevents humans from avoiding the often messy politics surrounding environmental change and those responsible for it (Barry 244). Pollution and negative changes in the environment are not just constructed concepts of social and political ideas. They are very real, existing because of direct action taken by human beings, and it is the hope of ecocritics that these actions can be somewhat reversed when people begin to accept responsibility for them.

While ecocriticism continues to enjoy application to texts deemed more traditionally environmental, many critics are beginning to acknowledge that much of what was once seen as pure and natural has shifted over time. In this shifting of perspectives, the definition of what is and is not natural has changed, as has the notion that such a dichotomy even exists and should be upheld. In an interview featured in Michael Bennett and David Teague’s *The Nature of Cities*, Andrew Ross discusses the evolving concept of urban ecocriticism, which seeks to eradicate the unequivocal divide between nature and city that traditional ecocritics have embraced since the beginning of the movement. “The literature of conservation,” he claims, “is persistent in its demonization of the city. In the dominant environmental literature, the city is sick, monstrous, blighted, ecocidal, life-denying, [and] parasitical” (qtd. in Bennett and Teague 16). And yet, urban ecocriticism does not agree that the city should be viewed and demonized in this way. Rather, it opens the door to a much more inclusive interpretation of cities that seeks to embrace all aspects of an urban environment, no matter how unnatural they may initially appear.

The inclusivity of urban ecocriticism’s perspective is particularly useful when analyzing texts written by authors from the modernist movement. These authors, who wrote primarily in the late nineteenth and early twentieth centuries, felt that established literature often failed to accurately capture the human experience; they therefore attempted to portray the changing world around them more truthfully and with more accuracy than their literary predecessors. According to Peter Howarth, this was achieved “by disorienting and bewildering” their readers with experiments in style, form, and content that strayed from literary conventions of the time (31). These authors were keenly aware of

the world around them and sought to use these experiments to make critical claims and assertions about the lifestyle, culture, and politics of their modern world (Howarth 31). This world, however, was vastly different from the one that had influenced earlier literature, making the modernist goal of analyzing and reframing their perspective understandable and arguably necessary for cultural progress.

Carol Cantrell, a literary scholar who explores the historical context and intersectionality between modernism and urban ecocriticism, cites World War I as “the most visible evidence of a fault line of catastrophe which utterly reshaped reality” for modern writers, forcing them to recognize the altered state of their world (33). She claims that this war necessitated modernism’s refocusing on aspects of reality that had normally been kept in the background. The environment, regardless of the destruction it had experienced, was one of these aspects that needed redefinition (Cantrell 34). When modern authors wrote of the natural world, it was often in a way that illustrated the negative impacts of urbanization and growth; T.S. Eliot’s *The Wasteland* clearly demonstrates this perspective and is often noted as the most prominent and explicit example of the modern attitude toward nature (Rozelle

36). Because traditional representations of nature were becoming increasingly rare and distant, modern authors were instead compelled to explore the urban environments that they and many of their readers inhabited. These cities were often presented as places of darkness and pollution, seemingly in line with the anti-urban outlook that defined traditional ecocriticism. Cantrell asserts, however, that many modernists found this urban darkness “simultaneously devastating and exhilarating,” allowing for an urban ecocritical approach that looks beyond the unnatural depictions of city life (34). Urban ecocritics, she argues, must ask themselves what these depictions imply. Is it, simply put, that the modern city is inherently a place of entropy and decay? Or is there a larger connection to be found?

These are the kind of questions that led to the development of ecosublimity, a term coined in 2006 by Lee Rozelle in his book *Ecosublime: Environmental Awe and Terror from New World to Oddworld*. At its core, ecosublimity refers to the possibility of human connection with nature in an all but post-natural world or, more specifically in a literary context, “the awe and terror that occurs when literary

figures experience the infinite complexity and contingency of place” (Rozelle 1). The goal of this branch of ecocriticism is to move beyond traditional definitions of environment and to instead interrogate the ways in which literary works provide opportunities for their characters to find revival; this revival comes from the characters’ knowledge of self and place and the role that humans have in reversing negative environmental change. The concept of ecosublimity, therefore, attempts to answer the questions posited by Andrew Ross and urban ecocriticism, hoping to find ways for the modern city-dweller (and perhaps even the suburbanite) to advance their “emotional and behavioral relationships to the outside” (Rozelle 2). It is the belief of ecosublimity that such advancements are the only way for humans to find contentment in the modern world. Without a strong sense of connection to the environment,

urban and altered as it may be in the modernist perspective, there is no hope of connection with others or, more importantly, with oneself.

Many modern poets, T.S. Eliot included, seem to provide in their works a setup for achieving ecosublimity. In “The Love Song of J. Alfred Prufrock,” Eliot highlights the urban features of Prufrock’s modern environment that, while inherently negative, give him a chance to experience the impact of human expansion on what was once purely natural. The etherized evening sky and soot-covered feline smoke at the beginning of the poem, for example, suggest that the city in which Prufrock lives retains both natural and artificial elements. Prufrock is surrounded by these offerings of a new, hybrid form of urban environment—and yet he



Lonesome Tree in the Water

is still monumentally unhappy. This unhappiness does not appear to stem directly from his physical environment, however. Instead, the reader is led to believe that it is the social environment of his modern existence that causes his unhappiness. He laments “the voices dying with a dying fall / Beneath the music from a farther room” that leave him frozen, unable to act and take control over his own life (52-53). In this way, Eliot sets up the distinction between Prufrock’s physical and social environments as a false dichotomy, effectively illustrating Andrew Ross’s concept of an urban ecosystem. This construct creates a “rhetorical image of the city as an immense biological organism, hopelessly overextended [...] and totally beyond any carrying capacity or sustainable organization” (Ross qtd. in Bennett and Teague 17). It also aligns with the modernist reconstruction of place that allows for the interpretation of both natural and artificial aspects of an urban environment. In this distinctly modern ecosystem, the negative effects of urbanization act as a sort of anesthetic that paralyzes the natural environment, paralleling the ways in which upper-class urban society paralyzes Prufrock and prevents him from connecting to the meaningless world around him. By drawing these parallels, Eliot suggests that environmental and interpersonal entropy are interdependent, and that one cannot possibly transcend a world of “growing material uncertainties” while ignoring negative environmental change (Rozelle 37).

SETTING THE SCENE

Urbanization administers its first dose of anesthesia in the opening lines of “The Love Song of J. Alfred Prufrock”. Prufrock, the presumed narrator of the poem, invites the reader to take a walk with him at night, “When the evening

is spread out against the sky / Like a patient etherized upon a table” (Eliot 2-3). This characterization of the evening sky as sedated and numb, strapped helplessly to a surgical table, immediately establishes an anxious mood that is sustained throughout the poem. The sky, a fully-natural entity independent of human creation, is suddenly under the deadening influence of an artificial drug, and the resulting sedation helps to bring readers to an understanding that this urban setting has lost much of what once connected it to the natural world. Carol Cantrell argues that this description of setting is an inherent aspect of the modernist movement, and that “much of the task of re-imagining for modern writers involves jarring themselves and their viewers or readers not just out of conventional thought but out of [...] the habit of thinking of place as ‘landscape’” (37). The reader is instead invited to view the urban landscape as a place lacking much of what would make it traditionally natural; in this poem, the social environment that Prufrock describes with such melancholy becomes just as important a factor as the physical world in which he is situated.

Carol Cantrell argues that, particularly with modern literature such as “Love Song,” readers and critics must be willing to analyze both of these environments simultaneously, as they are interdependent and work together to recreate the traditional notion of place. This interdependency alluded to in the opening stanza helps to illustrate Eliot’s argument that natural decay is mirrored by and related to the social and mental challenges expressed by Prufrock in his narration. This concept is slowly moving to the forefront of discussions on urban ecocriticism and its sociocultural implications, which seek to include more topics and ideas than traditional literary criticism as a whole. Andrew Ross explains this movement in *The Nature of Cities*:



Chicago City Skyline

Unless you attend to these social features [redistribution of wealth, restructuring of political power, desegregation] you can't fully understand the effects upon the material environment. Nor can you understand the culture of cities, the folklore and psychology of urbanism [...] and so on, which are even less conventionally the objects of green criticism.
(qtd. in Bennett and Teague 18)

While "Love Song" does not directly address the social issues that Ross points to in his interview, the idea that the natural environments of cities are interwoven with, and dependent upon, their social and culture environments allows readers of the poem to make larger connections between its infamously unstable narrator and the anesthetized city in which he lives.

Following this initial discussion of the natural world under the influence, Prufrock takes the reader further into the darkness of the city, down "half-deserted streets" that facilitate a transition from the quasi-natural to the fully urban (Eliot 4). In the same way that urbanization anesthetizes the evening sky, the "streets that follow like a tedious argument / of insidious intent" lead Prufrock to anxiety-inducing social situations that paralyze him (8-9). Eliot purposefully juxtaposes this opening stanza with a couplet that becomes one of the poem's most famous refrains: "In the room the women come and go / Talking of Michelangelo" (13-14). In doing so, Eliot makes a connection between the stale monotony of the physical environment and the way that Prufrock views the culture of the upper-class. These women represent the kind of conversations that Prufrock

is not comfortable with, focused on art and history and an ever-present need to prove oneself in the face of social pressures. Even if Prufrock did not suffer from crippling social anxiety, the reader is left to question if he would still be able to face this room full of women in an environment that is, in so many ways, polluted and lacking vitality. Lee Rozelle claims that modern authors often "equate [...] urban spaces with lack, leaving inhabitants without the necessary essence for reproductive viability and spiritual renewal" (38); these seem to be precisely the things that Prufrock himself cannot find.

FELINE IMAGERY

In the third stanza of "The Love Song of J. Alfred Prufrock," Eliot continues to characterize natural aspects of the urban environment with imagery that likens the "yellow fog" to a cat that "rubs its back upon the window-panes" (15). Initially, this living representation of the fog, a natural occurrence, appears to be nothing more than simple comparison; in line 16, however, the fog becomes "the yellow smoke that rubs its muzzle on the window-panes," designating a shift from the natural (the fog) to that which has been tainted by man (the smoke). This feline imagery continues throughout the stanza, turning the evening into a cat that "let fall upon its back the soot that falls from chimneys," a line which seems to demonstrate nature's passivity toward its own distortion (Eliot 19). There is also, as Anthony Cuda suggests, a connection to be made between this passive personification of nature and the poem's original description of the etherized patient. Both images of nature seem to represent "a radically vulnerable, physical paralysis, a body whose dulled awareness remains but which cannot move to protect itself" (Cuda 36). By so thoroughly describing the



urban setting of the poem with images of semi-consciousness and passive vulnerability, Eliot sets up Prufrock as an inevitable product of his environment.

This set up becomes reality in the next stanza, in which the conflicted Prufrock admits that “there will be time / For the yellow smoke that slides along the street / Rubbing its back upon the window-panes” (23-25). This acknowledgment that “there will be time” accepts the existence of the feline image of urban ecosystems, an embodiment of impurity and passive urban nature. Inherent in this acceptance are “hopes of interconnectivity” between Prufrock, the city, and its conglomerate environment of time and feline yellow smoke (Rozelle 37). Lee Rozelle argues that, especially in an urban setting, these hopes are necessary for finding connections and moving forward from pollution and corruption. In these first few lines of the stanza, Prufrock could be embracing the city and the potential for growth promised by urbanization. However, the reader is soon reminded of Prufrock’s obsessive mental state. He is unhealthily obsessed with time, and when he is faced with the possibility of “a hundred indecisions, / And for a hundred visions and revisions, / Before the taking of a toast and tea,” he is unable to use the time that is at once abundant and stifling in its abundance (32-34). All that this discussion of time does is bring him back to the room full of women discussing Michelangelo in lines 35 and 36; because Prufrock is never able to make use of the time and possibility provided by his urban environment, the poem fails to deliver the interconnectivity that it alludes to in this stanza and thus leaves the reader, and Prufrock, with simply an overwhelming sense of wasted time. The feline imagery, therefore, provides an elusive description of the urban ecosystem, one which hints at connection and hybridity but ultimately leads Prufrock further into his depressed mental state.

Eliot uses feline imagery again at the beginning of the twelfth stanza:

And the afternoon, the evening, sleeps so peacefully!
Smoothed by long fingers,
Asleep...tired...or it malingers,
Stretched on the floor, here beside you and me.
(75-78)

This extends the initial comparison of nature to a cat by using the same imagery to describe a time of day, the afternoon, that is at once a natural occurrence and a manufactured division of time. Instead of passive, polluted smoke, however, Eliot uses cat imagery to suggest that even time has been made sick by urbanization or, for reasons perhaps more confusing, it is faking its illness. This suggests that, in Eliot’s modern view of the world, the perversion of the natural environment extends beyond traditional manifestations of nature to time, a concept that Carol Cantrell argues is “an essential component of any place” (36). She claims that modernist settings forefront “the interdependence of ‘here’ with the ‘now,’” allowing the urban environment of

“Love Song” to include a variety of dimensions that must be considered when analyzing environmental impact. It makes sense, then, that Prufrock would be negatively impacted by the sickness of time and ask, “Should I, after tea and cakes and ices, / Have the strength to force the moment to its crisis?” (79-80). If the time of day in which these social situations occur itself lacks strength, then Prufrock, who expresses doubt and fear almost constantly, cannot possibly be expected to find strength of his own. This is, according to Peter Howarth, a condition unique to modernism and its depiction of city life. Modernist writers tend to expose the weakness and detachment that comes from the “rapid crowding of changing images, the sharp discontinuity in the grasp of a single glance, and the unexpectedness of onrushing impressions” (Simmel qtd. in Howarth 21). Howarth argues that this detachment led to the creation of a new kind of modern persona, the urbane, who functions well within the monotony of afternoon social visits (22). This is exactly the kind of persona that Prufrock attempts to avoid becoming throughout the poem. It seems, however, that he is unable to prevent a transformation that is inherently a part of his urban environment. Having already “measured out [his] life with coffee spoons,” Prufrock finds that he has little strength left to alter his path (Eliot 51).

GOING UNDER THE KNIFE

Images of ether, anesthesia, and surgical procedures are prevalent throughout “The Love Song of J. Alfred Prufrock,” and can be found elsewhere in much of T.S. Eliot’s poetry. Anthony Cuda explains this prevalence in his book *The Passions of Modernism*, giving historical and biographical accounts of Eliot and his experiences with ether to help readers better understand the poet’s obsession with artificial unconsciousness. According to Cuda, Eliot began his career as a philosophy student and literary critic, studying the works of William James and Edgar Allan Poe. Both of these writers were known for their exploration of human suffering and passion, focusing on the mind’s response to these intense emotional experiences in unorthodox ways. For reasons which would later become more clear, Eliot “gravitated toward accounts of ether-induced states of altered consciousness or ‘anesthetic revelations’” in his study of their works, and this seems to have influenced his own career as a writer (Cuda 40). Later accounts from friends and colleagues suggest that his wife Vivienne was addicted to ether, which might also help to explain the reoccurring presence of the drug in his texts. He witnessed the debilitating effects of this addiction daily, an experience which would no doubt have left him seeking to understand more about the anesthetic and its impact on the conscious and unconscious mind.

The fact that “Love Song” is one of Eliot’s earliest poems, then, perhaps helps to explain the abundance of references to ether and surgery it contains. In the eighth stanza, Prufrock laments the paralysis he experiences in social situations:

And I have known the eyes already, known them all—
 The eyes that fix you in a formulated phrase,
 And when I am formulated, sprawling on a pin,
 When I am pinned and wriggling on the wall,
 Then how should I begin
 To spit out all the butt-ends of my days and ways? (55-60)

This description is one of the first times that Prufrock clearly draws a parallel between himself and the physical environment that has been, from the poem's beginning, lying comatose on a surgical table. He feels trapped by the world of upper-class urban society, forced to endure the scrutiny of those against whose opinions he measures himself. This entrapment is to be expected, however, in an urban environment that has taken on an anesthetized and passive role. Prufrock cannot help his feeling of being "pinned and wriggling on the wall" when this is the end result of a modern existence, both for humans and for the environment which must endure a forced change into the quasi-natural. Eliot suggests that an urban ecosystem, which is made up of the environment and the humans who continue to alter it, necessitates this kind of mental and social dissection; this is a relationship that, according to Cuda, Eliot likely would have wanted to explore as he learned more about the effects of ether (41).

Eliot's personal life becomes even more clearly connected to his views on the anesthetization of urban environments in the poem's concluding stanza. Prufrock, addressing his remarks to an ambiguously collective "we," states quite suddenly: "We have lingered in the chambers of the sea / By sea-girls wreathed with seaweed red and brown / Till human voices wake us, and we drown" (Eliot 129-131). The fact that the poem ends with an image of waking from the murky, underwater world of ether is at first appropriate, as it began by situating its protagonist and reader in a comatose environment. As it happens, however, waking up leads to only to one result: we drown, falling back into some sort of unknown unconsciousness. It appears that the act of waking up only serves to drag us back into "the sinking blackness of ether" that Anthony Cuda describes in his exploration of T.S. Eliot and modernism (31). Cuda cites letters written by Eliot to a friend in which he describes being put into an ether-induced state of semi-consciousness before undergoing a minor jaw surgery. While the operation lasted only about an hour, Eliot recalls in his letter a "vague awareness of the surgeons chipping and scraping at his jaw," indicating that he retained some level of consciousness despite have been etherized (42). This experience seems to have spawned a line of questioning that would remain with Eliot throughout his career as a writer, critic, and poet: What if he had never woken up from this state? "What if," Cuda asks, "the

passivity to which he willingly succumbed did not dissipate along with the ether?" (42). This is the question posed by the abrupt ending of "The Love Song of J. Alfred Prufrock," a question that has much larger environmental implications when seen in the context of ecocriticism. Because Eliot has spent most of the poem likening the urban environment to a sedated and unstable living entity, the reader is left to wonder if this is the permanent state of urban ecosystems. Even if the sky, an etherized patient, could wake up, what would it find upon returning to consciousness?

HYBRIDITY

It seems that much of "The Love Song of J. Alfred Prufrock" suggests the redefinition of environment, especially in an urban context, as an amalgam of pieces both natural and artificial. This is in keeping with Andrew Ross' concept of urban ecocriticism and the modern redefinition of place. This movement toward a less unequivocal perception of the world may explain the seemingly odd inclusion of mermaids in the last several stanzas of the poem. Prufrock says of these mythical creatures: "I do not think that they will sing to me" (125). If this rejection were coming earlier in the poem, perhaps from the women in the room talking of Michelangelo, the reader might better understand their presence in the poem's conclusion. But these are not the same women whose criticisms have paralyzed Prufrock and contributed to his monumental insecurities. They are mermaids, mythical incarnations of women and fish who

“As it happens, however, waking up leads to only to one result: we drown, falling back into some sort of unknown unconsciousness.”

are, in many ways, the perfect example of a hybridity between humans and nature. They spend their days "riding seaward on the waves / Combing the white hair of the waves blown back / When the wind blows the water white and black" (126-128).

In this way, the mermaids attempt to blend the black and white waves of the water, opposite colors which represent the polarization that occurs when the environment is seen as either purely natural or completely artificial. It is interesting to note that it is the wind, a traditionally natural entity, which pushes the waves into this binary; the mermaids demonstrate their hybridity by attempting to end this limiting construct. Why, then, do these creatures deny Prufrock a similar solution? Why do they refuse to lend him their voices?

I am suggesting that this refusal represents a rejection much larger than simply that of the women whose criticism Prufrock seems to fear so urgently. Eliot leaves the reader with two related possibilities, one of which makes darker the implications of the other. First, the fact that these mermaids will not sing to Prufrock implies that such an ideal combination of natural and manufactured, a pure manifestation of hybridity, will not sing or make itself known to anyone; Prufrock's helplessness and anxiety are, for once, not the reasons he is being ignored. Instead, he is faced with the same consequences as any other human living

in the modern world: a harmonious relationship between people and the natural environment exists (or has existed) but can never be fully actualized in an urban ecosystem. As a character, Prufrock serves to support the possible conclusion that the ecosublime, while real, cannot be attained. This is fitting with the argument that Lee Rozelle makes in the introduction to *Ecosublime*. In this section, he argues that ecosublimity is innately dependent on achieving and celebrating hybridity between humans and whatever sort of environment they are a part of, as this hybridity allows for transcendence beyond the natural/artificial divide (Rozelle 8). “Love Song,” however, provides only a denial of hybridity, leaving modern humans to endure the anxiety that comes with “the tentativeness and incalculable uncertainty of their world” (Rozelle 7-8).

There is, however, another possible and slightly more ominous interpretation to be drawn from Eliot’s resolutely silent mermaids. Perhaps, in the modern, urban environment, a perfect hybridity simply does not exist. Arriving at this conclusion suggests, then, that the concept of ecosublimity itself is, from a modernist perspective, nonexistent and ultimately unattainable for humans. If the only example of this desired interconnectivity between humans and their environment is a mythical creature, then it is easy to understand why Prufrock will never hear the mermaids’ song: these creatures cannot possibly instill a promise of the ecosublime because they cannot possibly be real. This is the reality, according to Eliot, of modern existence within an urban ecosystem. Hybridity is a myth, only attainable in the ether-induced sleep brought on by urbanization and pollution. It is fitting, then, that the poem begins and ends with references to sleep and dreams, as this is the kind of world in which Prufrock and the modern human dwell. Eliot even goes so far as to cite Dante’s *Inferno* in the poem’s epigraph, establishing from the very beginning that “*di questo fondo / Non torno vivo alcun* [From these depths / No one has yet returned alive]” (trans. by Hollander XVII, 64-65).

CONCLUSION

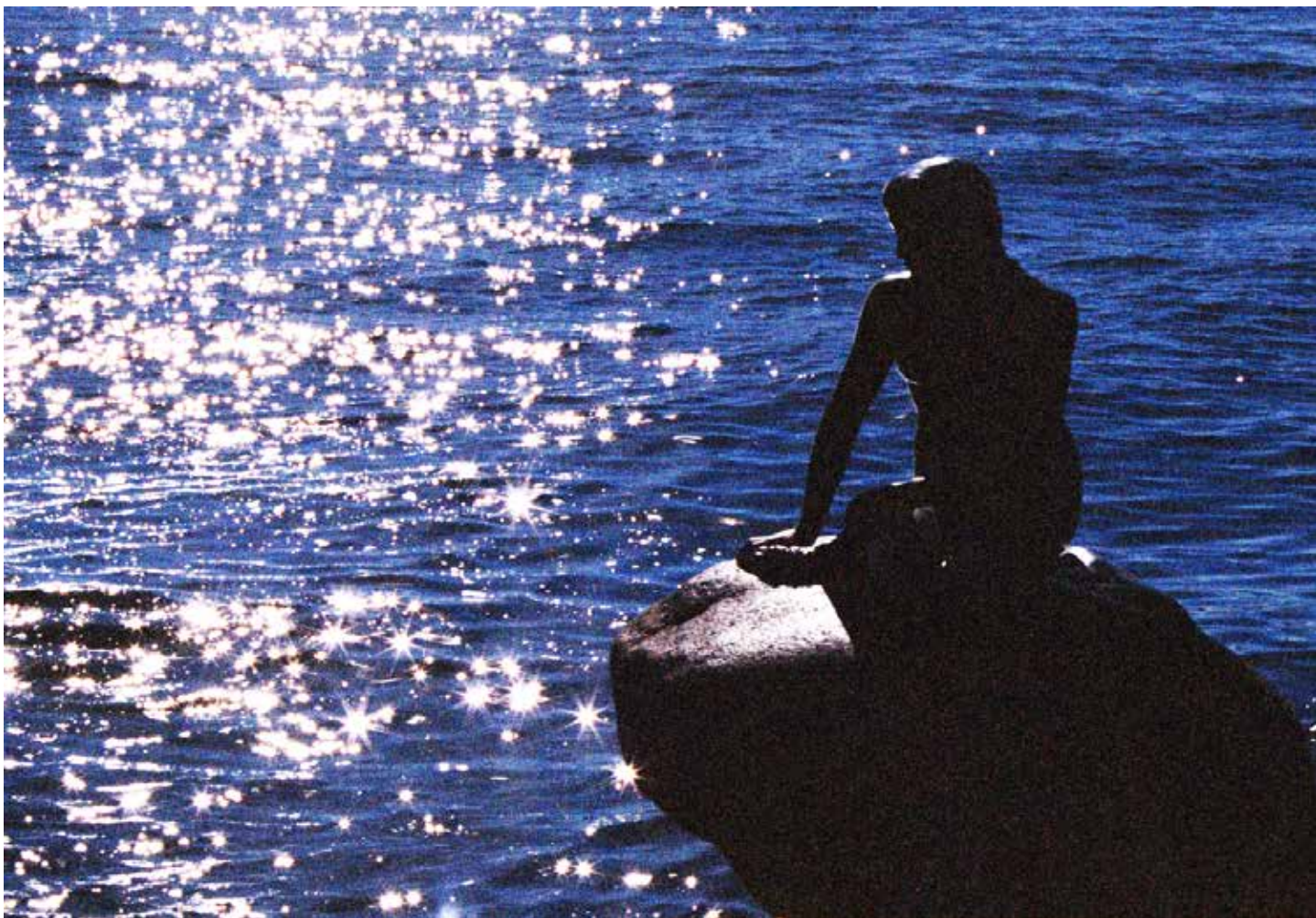
Ecocriticism is not the same critical theory that it was in the early 1970s. What was once a field dedicated to understanding literature and its relationship with nature has since grown to encompass a much more inclusive and nuanced definition of natural, one which works toward a concept of place over environment. In the context of modernism, this definition allows critics and readers to analyze environments and settings that lie outside the boundaries of what is typically considered natural, illuminating more fully the modern attitude toward nature, the environment, and urbanization. Modernism embraces the city as a new kind of wilderness that incorporates artificial and human aspects, providing humans living in urban spaces with an opportunity for connection in their post-natural world. This ecosublimity, however, is often an opportunity never actualized in modern writing; Lee Rozelle claims that many modernist authors create an environment conducive to

achieving ecosublimity and then fail to allow their characters to reach this point of achievement in the text.

T.S. Eliot creates this setup very clearly in “The Love Song of J. Alfred Prufrock”. By drawing parallels between the sedated natural environment of the poem and the urban society that paralyzes Prufrock, Eliot establishes an urban ecosystem that must be viewed and interpreted as the sum of all of its parts, both natural and artificial. This step toward a hybrid, urban environment suggests that the fates of both humans and nature are interdependent and that changes in one aspect, such as pollution or consumerism, will inevitably alter the other; Prufrock’s inability to overcome his anxiety, therefore, is to be expected in an urban setting that is itself plagued by its own pollution and paralysis. Prufrock, however, never uses this connection to his advantage and ultimately fails to reach the ecosublime. The hybridity inherent to this transcendent state is personified by mermaids at the poem’s end that do not lend their voices to Prufrock, denying him access to the benefits of an urban ecosystem.

This perspective, which incorporates urban ecocriticism and the notion of ecosublimity with modernist ideals, broadens our understanding of ecocriticism and its application to texts outside the realm of traditional nature writing. By interrogating the ways in which a modernist author such as Eliot uses depictions of the environment in both natural and artificial terms, the concept of nature itself shifts to become more than just setting. Instead, urban ecocriticism allows for a flexible understanding of place that is necessary for humans living in a twenty-first century world, one which is constantly changing and adapting to new technologies and growth. I am suggesting that this development in ecocriticism become a more permanent part of the critical lens, as it makes the theory much more applicable and relevant to a larger variety of texts from a much broader range of authors. The reality of the literary canon for today’s readers is such that many of the older, more traditional lenses do not always apply or cannot be fully understood outside of their context; just as feminist critical theory developed to inform and create queer theory, so too should ecocriticism continue to lend its ideals to urban studies and the ecosublime. These emerging theories not only broaden our ability to analyze literary texts—they aid us in coming to a more informed and enlightened perspective of our own environment, a knowledge that is necessary for effective and long-lasting environmental sustainability. 🐙

Kyle Whitaker is a 2014 graduate and English major with a minor in Italian studies. He is from Duluth, GA. As an Honors Fellow, Kyle researched the writing of high school students and pedagogy. As someone who has always been interested in the environment and sustainability, he was particularly inspired by eco criticism and the conflict that exists between the environment and modern living.



Silhouetted Mermaid

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Sognsvann Stillness by William Stirn '14

Red Deck

By Stephanie Butzer



Boat by Carmen Cordelia from sxc.hu

Stephanie Butzer is a 2014 graduate and print/online journalism major with a minor in creative writing. She is from New Jersey but currently lives in Alpharetta, GA. Stephanie is a member of Sigma Tau Delta and Lambda Pi Eta honor societies. She worked as a communications intern at the Conservators' Center, an exotic wildlife facility, and hopes to pursue similar work as an investigative reporter for an environmental magazine.

His boat was always bloody:
the damp wooden boards always softer.
His daughter asked about the spongy
red stains splashed along the dimpled
metal walls, and he would answer,
It's okay, it's really okay. I'm just protecting
you. But the metallic scent of dying muscles
fused with air when he returned from the sea,
and he knew she noticed when the deck's floor
turned so rich a red, it looked purple.
While she helped him tie
a twisted rope to secure
boat to dock, he fumbled over
the undeveloped shame that rose
as she picked at the remnants of each
day's work. The slumping bags, overflowing
with sharp-lined fins cut primitively
off stunned sharks,
were a blemish against the free-flying gulls.
He wanted her to only smell
the flavorful food on the table;
to see how much money he made when he sold
the fins to people across the sea for their soup.
He knew her mind would continue
to blossom, to take in details and administer,
so the jump in his chest wavered, hoping
she would never imagine his tuck-me-in hands
tossing a crippled creature overboard
knowing it would fail to stabilize the flight
without wings. He hoped she would
never envision what every hunter knew
about sharks without fins and suffocation
and the vulturine ways of slow starfish.



Outdoor Explorations with Preschoolers

The Role of Nature Experiences in Young Children's Psychological Development and Environmental Awareness

Article and Photos by Cara McClain

Children's direct experiences with nature have decreased dramatically, and today's children are growing increasingly isolated from the natural environment (Kahn, 2002; Louv, 2008). Research shows that nature experience is associated with improved cognitive abilities, resistance to depression, strengthened self-confidence and deeper friendships (Louv, 2008). Through nature play experiences, children learn to enjoy time outdoors and prepare for participation in environmental preservation (Chawla & Cushing, 2007). Nature experience is crucial because a sense of belonging to a larger nature community is a key component for environmental protection (Mayer & Frantz, 2004). Despite this, few studies have examined the influences of nature experiences on preschoolers. The present research was a one-year longitudinal case study of a Reggio-inspired preschool that provides a variety of outdoor experiences on a daily basis. Eleven preschoolers were filmed for 50 hours over the course of a year at a school's garden, creek, and a local river. Parent surveys, teacher interviews, and child interviews were also collected at the beginning and end of the school year. Three key research questions were examined. First, what are the influences of various

environmental features on children's physical behaviors, their positive and negative peer interactions, and their cognitive development related to environmental awareness? Second, how does experience in natural settings influence three preschoolers' development with regard to personal challenges, scientific discovery, stewardship, and social behaviors? Third, how do teachers and parents guide and support children's interactions in nature? Initial findings from the observational data indicated that while outdoors children participated in complex pretend play, showed self-awareness with regard to environmental features, exhibited far more positive than negative social behavior, generated scientific theories around discoveries, and engaged in environmental stewardship. Teachers and parents provided extensive support for children's nature experiences. The findings suggest that children's understanding of nature is based on their direct experiences, supported by adult guidance and encouragement. Additional results are in progress. The findings of this research will contribute to the fields of education and development, particularly with regard to the importance of nature experiences for children's physical, socio-emotional and cognitive development in early childhood.

“The findings suggest that children's understanding of nature is based on their direct experiences, supported by adult guidance and encouragement.”



WHAT DO YOU LIKE TO DO IN THE GARDEN?

"I like hiding behind the rosemary bush. I like putting the seeds in."

"Pick snap peas. 'Cause sometimes I like to pop some in my mouth and then put in the bucket, pop in my mouth, put in bucket."



WHAT'S FUN TO DO AT THE RIVER?

"Playing in the water. Especially trying to get across the current – that was kind of like a challenge."

"Climbing rocks."

"Climbing all the way to almost the other side in the river."

"It's fun that we could just like stay there until we find nature."



WHY IS IT GOOD TO GO TO THE RIVER?

"Because it's so big. Because it has lots of interesting stuff, like lots of trees and nature."

"Because you get wet. I love getting soaked, yeah, I love getting so-oh-oaked."



WHAT DO YOU LIKE TO DO AT THE CREEK?

"I like to fill my boots with water and get my socks all soaking."

"Well, swinging on the rope, and sometimes when there's no water, I swing on the rope and I release my hands and I plop on the creek."

"Jump on mud."



WHAT DO YOU DO TO TAKE CARE OF NATURE?

"Not pollute and don't throw trash in the water and like that stuff."

"Like water the trees. And feed the ducks. Like sometimes we go with Gaga [his grandmother] to this swamp where there's ducks and we feed the ducks bread."

"Take a ant to its ant hill and put it on a stick and put it with its family on wherever there's a ant hill."

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WHAT DO YOU THINK NATURE MEANS?

"Nature is trees. And nature is grass. And nature's water. Nature's animals."

"It's like the duck I play with in the bathtub."

"Well it means all the trees surrounding you and the leaves on the ground and what's good about nature is they help you breathe and snow even helps you breathe and if there was no snow, then you'd be like warmth to death. You also need coldness, not just warmth."

"Nature means don't touch anything because they can wander wherever they want to."



Population Dynamics of Small-Mammals Across Various Habitats

By Will Hemminger

ABSTRACT

Small-mammals prefer different habitats for different reasons, with some habitats having higher densities and total number of species than others. Studies have concluded that several factors contribute to habitat preference among small-mammals including climate, vegetation, and competition. Which drivers are more of a determinant of habitat preference is still an ongoing debate and a topic of research in the field of ecology. Habitat selection of small mammals can also lead to evolutionary changes, resulting in new preferences and distributions of these animals, in addition to speciation. I believe that abiotic factors such as climate have the greatest effect on where species are located, but biotic factors correlate more strongly to how species are distributed within their habitat. Both abiotic and biotic factors, however, are greatly influenced by human activity. By studying the population dynamics and distributions of small mammals across different habitats, we are given greater insight on several human-caused environmental consequences such as climate change and land-use changes.

BACKGROUND

This review will look at how climate, vegetation, and other density-dependent factors drive small-mammal distribution in different habitats. All of these have important roles in how they affect population dynamics in a habitat, but their effects can vary from place to place. For example, climate change has greater impacts in some regions rather than others. How climate is not only affecting distributions currently, but also how climate change will impact distributions in the future will be discussed in this essay. One of the best pieces of evidence we have that climate change is a meaningful threat to biodiversity is studies done showing the retraction of species' geographic ranges. Not only is this prominent in small-mammals but in numerous other species around the world, both

terrestrial and aquatic species. Next, this review will look at how the abundance and distribution of vegetation can impact small-mammal distribution. Small-mammals and vegetation have an important ecological relationship as the vegetation provides a food source and small-mammals can disperse seeds away from the host plant, as squirrels do with acorns when they do not use them as food. Other density-dependent factors such as competition and predation will be examined to determine if these are significant drivers in small-mammal distribution and how they impact the population dynamics in communities. Lastly, this review will address how all these factors interact with one another to give us the best insight into the relative importance of what influences distribution the most.

THE ROLE OF ABIOTIC FACTORS: CLIMATE

Climate is the primary reason why biomes and habitats are located where they are and it influences where and how species are distributed within a habitat (Smith 2001). For example, temperature is a primary determinant of biomass at a coarse scale and therefore can be a broader determinant of population and community dynamics. Climate patterns have been observed and recorded across different regions and habitats for several decades but it is becoming increasingly difficult to determine its effect on populations and communities of species due to climate change. In the case of small-mammals, specific habitats have different patterns on how climate affects communities.

In Yosemite National Park where the terrain is mountainous, trends are showing that species are moving to higher elevations due to increasing temperatures in the region (Moritz 2008). As a result, habitat ranges among species are contracting, leading to greater competition for resources. Because of climate change causing shifts in distributions, more species are sharing overlapping ranges, leading to increased competition and coexistence. This is evident in one study done on amphibians in Southeast Asia,

where species are seeking cooler microhabitats to escape increasing temperature (Bickford 2010). The same is true for small-mammals. The concept of coexistence is becoming of greater importance in the field of ecology as more species are overlapping in ranges due to climate change. This is becoming increasingly evident as shown in a study done in Utah on small-mammal diversity. Researchers found that the greatest richness of species was distributed at mid-elevation gradients where there is the greatest amount of overlap among habitats (Rowe 2009). This study, however, could not directly correlate climate factors including temperature and precipitation as being the main drivers of this distribution.

Other abiotic factors such as soil quality, nutrients, and water availability that are driven by climate can impact the population dynamics of small-mammals. For example, a disturbance such as a fire that can be caused by climatic factors such as extreme heat or a lack of precipitation can result in alterations in soil structure and nutrient availability that can either increase or decrease the abundance of small-mammals depending on how it correlates with other biotic factors (Kasso 2010, Franc 2013). This shows, however, that climate processes and their effects are extremely complex, and that we still have a limited understanding of how climate change will affect species.



Praia do Poco

THE ROLE OF BIOTIC FACTORS: VEGETATION

Vegetation has been shown in numerous studies to provide species, especially small-mammals, with necessary resources that are crucial for their survival and reproduction. As a result, this means that it also impacts where species are distributed. Human impacts to biotic factors will thus strongly effect the distribution of small-mammals.

One group of researchers looked at how land-use change affected by human activity can affect the spatial distribution and population structure of small-mammals. They found

that in patches furthest away from the urban center, species richness and diversity increased as there was greater food availability from increased biomass (Lopucki 2013). It can be concluded that greater food availability will result in higher colonization rates, affecting the community structure of the habitat and how species coexist with one another. The study also showed how distribution of small-mammals can demonstrate how a population is evolving, as the few species found in the downtown patches where

there is nearly no vegetation were found to be capable of eating human food, which is possible due to physiological changes in the species' stomachs (Lopucki 2013).

Certain types of vegetation can also have effects on food availability, which is crucial in order for small-mammals to survive. In an old-growth Atlantic forest in Brazil, one study found a positive relationship between small-mammal abundance and woody debris (Naxara 2009). Woody debris provides herbivorous small-mammals with a food source as well as habitat for invertebrates. In the same study, Naxara et al. found that arthropod abundance increases due to increased ground cover from woody debris and litter biomass (Naxara 2009). This results in a greater abundance and greater density of small-mammals as food availability increases for insectivores.

Another example of how vegetation can affect colonization rates of small-mammals is in the presence of a disturbance. Rates and intensities of disturbances are also affected by human activity, such as clear cutting, habitat fragmentation, and pollution. One common disturbance is a wildfire, where there can be a complete loss of vegetation, altering the distribution of several species, leading to lower colonization rates than in other habitats (Franc 2013). However, depending on the rate of colonization among the successional vegetation, some small-mammal species may be better suited for early colonization because there is less competition. Franc et al. also found that species richness after a disturbance was lower than before the disturbance, most likely as result of the decrease in biomass that occurs after a fire (Franc 2013).



Micos

Vegetation, as shown, can have a multitude of effects on the distribution of small-mammals within a habitat, which means it's critical that the distribution of vegetation be studied along with the distribution of small-mammals in future research.

THE EFFECTS OF DENSITY-DEPENDENT DRIVERS ON SMALL-MAMMALS

The density-dependent drivers of competition and predation can greatly affect the population dynamics and distribution of small-mammals. In the case of competition, one species is going to outcompete the other for the limiting resource, causing fluctuations in the population of both species. Therefore, the strength of competition in a habitat will strongly influence distributions.

Laboratory experiments have shown that when interspecific competition is eliminated, a species is able to fulfill its fundamental niche and use as many resources as necessary for survival. One study showed that small-mammals selected habitats based on where there was the greatest amount of resources, as there were no competitors to prevent them from obtaining those resources (Morris 2010). The absence of competitors, however, occurs nowhere in the world for small-mammals. In fact, it is humans that seem to be their biggest competitors, as human activity such as urbanization, deforestation, and increased pollution is causing habitats to shrink, resulting in greater inter and intraspecific competition.

Predation is also another density-dependent factor that is especially common among small-mammals as they have numerous predators, ranging from larger mammals to birds and snakes. In a population of lemmings in southern Norway, climate change has affected their population cycles by reducing their abundance and altering their distribution, which has also caused the population of lemmings' predators to decline as well (Kausrud 2008). This shows how predator-prey relationships are affected when one of the populations crashes, as it usually leads to the crash of the other population. The relationship between lemmings and their predators, however, seems to be more complex than a classic predator/prey relationship. The decline in the lemming population may be a result of mesopredation, which occurs when apex predators' populations decline, leading to a rise in the population of middle trophic predators, such as smaller birds, who feed on lower trophic species. This hypothesis, however, has yet to be proven.

Intraspecific competition also plays a role in the population dynamics and distribution of small-mammals. All species have a carrying capacity that limits their population from growing to a size greater than the amount of resources in a given area. One study found that intraspecific factors were the main cause for population densities among small-mammals in that they were limited by seasonal changes in resources (Solonen 2010). This indicates that the distribution of many small-mammals is determined by the dynamics of its own species.

Population pressures within a habitat can also affect a population's fitness and recruitment, leading sink and source populations. Source populations are those with the greatest fitness levels and recruitment rates, whereas sink populations compose of weaker individuals that rely heavily on immigration for their survival as a population (Beck 2004). Source-sink dynamics can help explain how predation can alter a species distribution as well as give us further insight on future population distribution in a habitat.

INTERACTION OF DRIVERS

It is extremely difficult to determine which factor is a better predictor of small-mammal distribution, as there are too many variables to take into account that may affect results. Even studies don't always agree with one another, as some say that there are definitive results that one factor is the main driver, while others say that is a combination of many factors. In a study done in the mountainous Yosemite National Park, researchers constructed both single and multi-species models with three different drivers: climate-only, vegetation-only, and climate and vegetation. They found that at different altitudes, different drivers were more influential than others, but the most dominant driver across all altitudes was climate-only (Rubidge 2011). These results may be explained due to the fact that climatic changes occur more explicitly at smaller spatial scales, such as in mountainous habitats where temperatures are more greatly influenced by altitude than latitude. It was found that no set of factors best explained the distribution patterns found at different elevations, in another study done in a similar region (Rowe 2009). This study looked at several more specific factors such as temperature, precipitation, productivity, area, habitat heterogeneity, and the mid-domain effect. There were significantly strong correlations between distribution and the drivers only when the variables were tested in independence of one another (Rowe 2009). Unfortunately, it is difficult to extrapolate

any conclusions from results like these, because we know that no one factor will ever be completely isolated.

Some studies will even contradict what we thought may be important drivers of distribution and abundance are not actually that significant. Beck et al. found that resource availability, specifically light availability from treefall gaps, was not a significant factor driving habitat-specific population dynamics (Beck 2004). These results would go against other studies cited in this review, such as Lopucki et al. and their study on urbanization and its effects on population structure of small-mammals. They found that resource availability was crucial in distribution of small-mammals as they found that with increased vegetation, there is a greater abundance of species (Lopucki 2013).

Given all of these studies, it is tough to conclude with certainty how all of the factors interact with each other and what their impacts are on small-mammals. There are things that can be said for certain, however. One, is that climate change is affecting populations in multiple habitats and is leading to the retraction of geographic ranges of most species. Another is that further research needs to be done to see how the distribution of small-mammals is changing and how we can better examine which factors are most influential.

CONCLUSION

Because we still don't know conclusively why small-mammals choose the habitats that they do, it is tough to implement conservation management techniques needed to preserve their populations. One basic principle is that we must lessen the rate of habitat loss as these studies show that small-mammals are a generalist group of species that can live in several habitats and environments. Some, however, are confined to very specific habitats, such as those that live in high-elevation habitats, which makes their conservation even more crucial. As mentioned earlier, the need for future research is critical if we want to better understand how distribution drivers affect not only small-mammals but other species in the future. Future research can also answer evolutionary questions that may help us explain how populations of small-mammals fluctuate over time. Conservation goals cannot be achieved if we do not spend more time study these species and their interactions among habitats.

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Praia do Poco by Felipe Hadler from sxc.hu

Micos by Leonardo Barbosa from sxc.hu

The Keystone XL Pipeline Decision

By Cameron Douglass

In 2005, the TransCanada Corporation, a North American energy company based in Alberta, Canada, announced its plan to construct the Keystone Pipeline System. The constructed pipeline would transport crude oil from Alberta, Canada to refineries in the Midwest and Gulf Coast of the United States. The Keystone Pipeline System was proposed in two segments: the Keystone and the Keystone XL. The Keystone segment was completed in two phases, and resulted in a pipeline that runs 1,353 miles from Hardisty, Alberta to refineries in the Midwest United States. The Keystone XL segment was also planned in two separate phases. The first phase of the Keystone XL pipeline connected the Keystone to refineries in Houston and Port Arthur, Texas. The second phase, called the Keystone XL Pipeline Project, is the proposed pipeline that would provide a more direct link from Alberta, Canada to Nebraska, where the crude oil would then be transported to the Gulf Coast. This proposed direct pipeline plan is awaiting approval from President Obama and Secretary of State John Kerry, since it crosses the international border between Canada and the United States, and would have significant environmental and economic impacts. An analysis of the existing pipeline and the proposed Keystone XL Pipeline Project reveals the potential environmental and economic implications of the proposed pipeline's implementation. The decision regarding its implementation may significantly alter the environment, while also having a great effect on the economy; however, understanding the progression of the pipeline itself, and the Alberta tar sands, where the oil is extracted, will help in understanding the importance of all the possible results (Parfomak et al. 1-5).

Tar sands, also called bitumen sands, are reserves holding an immense amount of bitumen, which can be refined into crude oil. The Alberta tar sands, located in Fort McMurray,

Canada, lie under 54,000 square miles of boreal forest, which is one quarter of the total area of Alberta, and can produce 9.4 million barrels of crude oil a day (Avery 5-6). Claims suggest that 1.7 trillion barrels of oil will be found in these tar sands when the right extraction technology becomes available (White 95). It wasn't until the early 1900s that the Canadian government took interest in the Alberta tar sands; however, aggressive development of the tar sands didn't start until the 1990s (White 93). In 2008, the TransCanada Corporation initiated the construction of phase one of the Keystone Pipeline. By the middle of 2008, there were sixty-nine projects extracting bitumen from the tar sands (White 93). The Keystone Pipeline, over 2,000 miles long, is a mega-transport for crude oil extracted



Alaskan Pipeline

from the tar sands found in the counties surrounding the City of Fort McMurray, Alberta (Cherry 126). The oil extracted from the tar sands is brought through Steele City, Nebraska to refineries in Wood River and Patoka, Illinois (Cherry 126). Phase two of the pipeline, entitled Keystone Cushing, was completed in February 2011, and extended the Keystone Pipeline 300 miles from Steele City, Nebraska to Cushing, Oklahoma (Parfomak et al. 3). The Gulf Coast Pipeline Project is the first phase to the Keystone XL segment, approved by the Army Corps of Engineers in July, 2012, and extended the pipeline 485 miles from Cushing, Oklahoma to Houston and Port Arthur, Texas (Hoberg et al., 18). The final phase, called the Keystone XL Pipeline

Project, is currently a proposed plan to provide a 1,200-mile direct pipeline from Alberta, Canada to Steele City, Nebraska in order to avoid the transportation of oil to the Midwest. If this plan proceeds, the total pipeline system would have the potential to expand from 591,000 barrels a day to about 830,000 barrels a day (Parfomak et al. 4).

This final phase is under review by President Barack Obama and Secretary of State John Kerry because the Keystone XL Pipeline Project crosses an international border. The President, along with the Secretary of State, will ultimately decide whether the project is implemented or not. This final phase has the potential to reduce the United States reliance on Middle Eastern oil and improve the economy, but has



extremely negative environmental implications. President Obama has knocked down the proposal for the final phase of the Keystone XL Pipeline Project twice. Almost three years ago, a presidential postponement cancelled the project for the first time. Obama later turned it down again when it came as an amendment to the Payroll Tax Bill. The TransCanada Corporation has pushed, once more, for President Obama and Secretary of State John Kerry to vote on the pipeline extension. Samuel Avery claims that there is confusion regarding how President Obama will ultimately vote: “The president [sic], despite overtly opposing the pipeline, seems to be encouraging TransCanada to keep pushing it. He applauded the go-ahead on the southern leg

and said he would ‘take every step possible to expedite the necessary federal [sic] permits.’ Maybe his disapproval of the pipeline as a whole is just a temporary appeasement of a few environmental wackos after all.” The pundits affirm that he must be against it due to his campaigning as an environmentalist (Avery 1, 28). Regardless, Brad Plumer of The Washington Post reports that Obama stated that “allowing the Keystone pipeline to be built requires a finding that doing so would be in our nation’s interest.” Obama said, “And our national interest will be served only if this project does not significantly exacerbate the problem of carbon pollution...The net effects of climate impact will be absolutely critical to determining whether this project will go forward.” He added, “It is relevant” (Plumer 1). Ultimately, allowing the pipeline extension to be built would mean that President Obama believes that the economic benefits will outweigh the environmental degradation. In his decision, Obama must weigh the varying effects of the pipeline to determine what decision is in the national interest. The environmental impacts of the pipeline will be largely considered before a decision is made.

Since the 1990s, a wide range of methods for mining bitumen have been experimented with, however, only two methods are in use today: the strip-mining approach used on the surface of the land, and the in situ approach used underground. About twenty percent of tar sands are extracted using strip-mining, while the remaining eighty percent are extracted using in situ methods. Neither of these methods maintains the environment in which they are applied. Strip-mining for bitumen destroys the boreal forests that the tar sands lie under, creating millions of gallons of waste, while in situ methods make one to three million acres of land uninhabitable for many local species (Avery 5).

With the inevitable increase in tar sand production that would come with the approval of the Keystone XL Pipeline Project, natural gas consumption could triple by 2015 (White 93-94). Tar sand bitumen is five percent sulfur, one half percent nitrogen, one tenth of one percent heavy metals, and the rest hydrocarbon. It is more carbon than hydrogen, meaning it must be upgraded for human use by adding hydrogen. This process of upgrading requires the burning of fossil fuels, usually natural gas, to convert the bitumen into a synthetic in order to be able to move through a pipeline. Upgrading bitumen adds one to two hundred pounds of carbon dioxide into the atmosphere for every barrel. Furthermore, when compared to refining conventional oil, upgrading bitumen produces two to three times more sulfur dioxide in the atmosphere, which is the cause of acid rain. It also adds two to three times more volatile organic compounds, which are producers of ground level ozone, and particulate matter, which causes heart and lung issues. By 2020, upgrading bitumen will release 127 to 140 megatons a year of carbon dioxide. When refined and used, the tar sands will emit 50 to 60 parts per million (ppm) of carbon dioxide to the atmosphere over the next

half-century. This would bring atmospheric carbon dioxide levels to 450 ppm, without considering the carbon dioxide emissions from coal, natural gas, or conventional oil. The pre-industrial level of atmospheric carbon dioxide was 280 ppm, the “safe” level is 350 ppm, and the current level is 393 ppm (Avery 4-5).

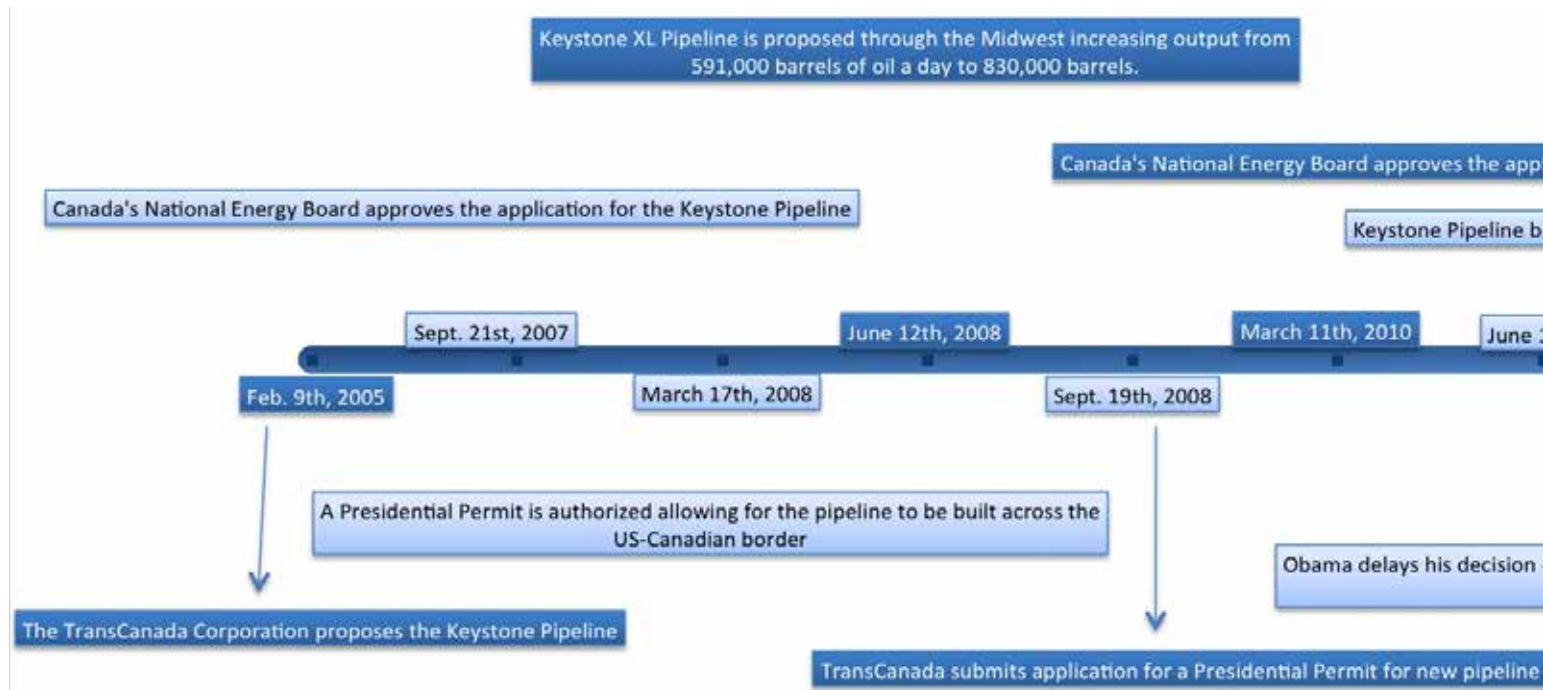
The Intergovernmental Panel on Climate Change estimates that by 2100, global temperatures will rise from 1.4 to 5.8 degrees Celsius. Computer models predict that if carbon levels are below 400 ppm, there is a seventy-five percent chance of preventing a global temperature increase of more than two degrees Celsius. Some economists say that a carbon dioxide level of below 550 ppm by 2100 is not economically realistic. With 550 ppm, there is a twenty percent chance of keeping the global temperature increase below two degrees Celsius. Even though it is a goal within the scientific community to improve atmospheric carbon levels to 350 ppm, a two-degree increase would still generate storms, droughts, habitat loss, loss of the Arctic ice cap, and the loss of many species (Avery 4-5). If the proposed pipeline is approved, the projected total greenhouse gas emissions from the production of oil will be the equivalent to adding 22.6 million cars to the road in the United States (Grant, Angen, and Dyer 4).

There is also a significant amount of freshwater needed in order to extract bitumen. The freshwater use intensity for strip-mining is 2.41 bbl/bbl, or 2.41 barrels of freshwater per barrel of oil, while in situ extraction uses .45 bbl/bbl. In 2011, tar sands operators used approximately 1.1 billion barrels of fresh water, or 34.65 trillion gallons of water, equivalent to the residential water consumption of 1.7 million Canadians. In 2022, if the entire Keystone XL Pipeline Project is approved, the daily use of freshwater for bitumen extraction is projected to be 4,861,389 barrels,

equivalent to filling 4.8 million bathtubs (Grant, Angen, and Dyer 3). This is an issue because available freshwater is becoming scarce, meaning more aquatic ecosystems are being degraded for increased freshwater consumption.

Using the method of strip-mining produces a waste by-product called tailings, which consists of water, clay, sand, salts, heavy metals, residual bitumen, and other toxic compounds. In order to store the tailings, oil industries create tailing ponds. These ponds currently cover about 43,500 acres of Alberta, containing about 220,000 gallons of tailings waste. Jennifer Grant, Eli Angen, and Simon Dyer describe using in situ extraction methods as requiring “development of a dense network of roads, pipelines, wellpads, and processing facilities across the boreal forest.” A typical tar sand project can clear more than eight percent of the boreal forest, equaling 3.46 acres per million barrels produced. Strip-mining operations require forests, wetlands, and soil to be clear cut, drained, and removed, equaling 23.2 acres of land disturbance per million barrels of production. If approved, by 2022, the proposed Keystone XL Pipeline Project tar sands development will result in the clearing of about forty-six acres of forest a day, or 34.5 football fields a day (Grant, Angen, and Dyer 6).

Lastly, the route of the proposed Keystone XL Pipeline Project is a concern because it would be constructed in the Sand Hills region of Nebraska. The Sand Hills is a 19,600 square mile region that consists of a high concentration of wetlands and sensitive ecosystems. A pipeline constructed in this area could pose numerous concerns regarding the health of the ecosystems throughout the Sand Hills, as well as the water quality of the Ogallala Aquifer. This aquifer is one of the largest sources of freshwater in the world. The porous soils of the Sand Hills allows for the aquifer to recharge through penetration of surface water (Parfomak et al. 18-19). Internal corrosion of the Alberta pipeline system accounted for sixteen times more spills than United



States pipelines (Swift et al. 9). Phase one of the pipeline spilled fourteen times in its first year (Cornell 2). This means that if the extension of the pipeline were approved, any potential leak in the pipeline would result in crude oil entering the aquifer, harming the quality of water which serves seventy-eight percent of the region's public water, eighty-three percent of irrigation in Nebraska, and thirty percent of irrigation in the United States (Parfomak et al. 19).

While the Keystone XL Pipeline Project poses various negative environmental threats with no real environmental benefits, the proposed pipeline extension would have a substantial positive affect on the economy of the United States. There are major contradictions, however, between the claims of the TransCanada Corporation and a study completed by the Cornell University Global Labor Institute regarding the economic implications of the Keystone Pipeline System and the proposed Keystone XL Pipeline Project. The TransCanada Corporation estimates that seven billion dollars will be spent in the United States for the project; however, this number may be vastly inflated. Lara Skinner, Sean Sweeney, Ian Goodman, and Brigid Rowan completed a budget analysis in a Cornell University study that estimates that a total of \$1.8 billion has been used, meaning the remaining spending equals approximately \$5.2 billion. In addition, TransCanada fails to reveal that approximately one-quarter of the original estimated seven billion dollars for the pipeline is actually the Canadian portion of the pipeline. This means that the Keystone XL Pipeline spending in the United States is actually less than four billion dollars (Skinner et al. 4-5). The inflated numbers presented by TransCanada, which are about three billion dollars too high, lower all of the economic benefits of the pipeline. With this in mind, there would be almost four billion dollars spent in the United States, which would improve our economy and unemployment rate.

This lower budget ultimately translates to fewer available jobs than originally expected before the study. The Cornell study also highlights TransCanada claims that, "the \$7 billion (KXL) pipeline project is expected to directly create more than 20,000 high-wage manufacturing jobs and construction jobs." If the Cornell study is correct, half these jobs will never materialize. Moreover, TransCanada states that approximately seventy-five percent of the pipe manufacturing will be in the United States. The Cornell study suggests that almost half of the material used for the pipeline will actually be produced outside of the United States, mainly because TransCanada has contracts with manufacturers outside of the United States for almost fifty percent of the project. It seems likely, therefore, that the "seventy-five percent" refers to the United States' role as the final processor of the pipes. This would mean that the pipes would not be manufactured in the United States, but would be double-jointed and coated here. Therefore, the jobs will not be manufacturing jobs, but rather jobs for pipe processing. Also, over forty percent of the employment estimated is only available in the state of Texas, while the other states with pipeline construction within their state lines will receive just a small portion of the jobs. Using all of the information provided by the Cornell study, construction would reduce unemployment rates by only 0.2% (Skinner et al. 11-26).

The TransCanada Corporation projections lack consideration of the potential jobs lost from the construction of the pipeline. They state that the pipeline will increase Midwest gasoline and diesel fuel prices by about ten to twenty cents more per gallon, resulting in jobs lost in agriculture and commercial transportation. Also, TransCanada fails to admit the possibility of pipeline spills. As stated earlier, phase one of the pipeline spilled fourteen times in its first year, even after their initial claim that, "a spill will only occur once every 20 years." Potential pipeline spills and pollution will result in hundreds of millions of



dollars in cleanup when compared to similar pipeline spills in the Kalamazoo River and the Yellowstone River (Skinner et al. 27-30).

Lastly, there is another potential economic benefit that would come from the construction of the Keystone XL Pipeline. In 1994, Canada signed the North American Free Trade Agreement (NAFTA) with the United States, which obligated Canada to share its energy sources proportionally with the United States, as they do with other foreign nations. Mainly because of NAFTA, Canada has become the United States' largest foreign supplier of oil. Currently, Canada supplies eighteen percent of the imports for the United States, and the continuing development of the tar sands. If passed, the Keystone XL Pipeline Project will likely double or triple the imports. This would mean that essentially forty to sixty percent of our oil imports would be from the Canada tar sands. These imports would help the United States in their effort to limit imports from the Middle East (White 93).

With billions of dollars at stake, there are major industry players who are large, powerful, and skilled enough to negotiate terms with the United States. ConocoPhillips, "the worlds largest oil giant," Shell Oil, the third largest oil company in the United States, Petro-Canada, and Husky Energy are the large international energy companies who have all invested billions of dollars into the Alberta tar sands. They are described by Robert White as "...the 'Big Oil' multinationals for the 'ecological nightmare' that is unfolding in northern Alberta and coming to haunt other parts of North America...they are the major players who are driving the development of this energy resource." Their financial and political influence on the United States government, specifically Barack Obama and John Kerry, could potentially lead to the implementation of the final stage of the Keystone XL Pipeline (White 91).

The Keystone Pipeline System currently transports 591,000 barrels of oil a day. President Barack Obama and Secretary of State John Kerry have the power to approve or deny the proposed Keystone XL Pipeline Project, an extension to the existing pipeline, which would increase the transportation of oil by almost 300,000 barrels. The extension has immense environmental implications, while also having economic benefits and disadvantages. The President and Secretary of State must weigh the implications of each to determine if the extension of the pipeline will be in the best interest of the United States. 🙄



Spring Forest at Lake

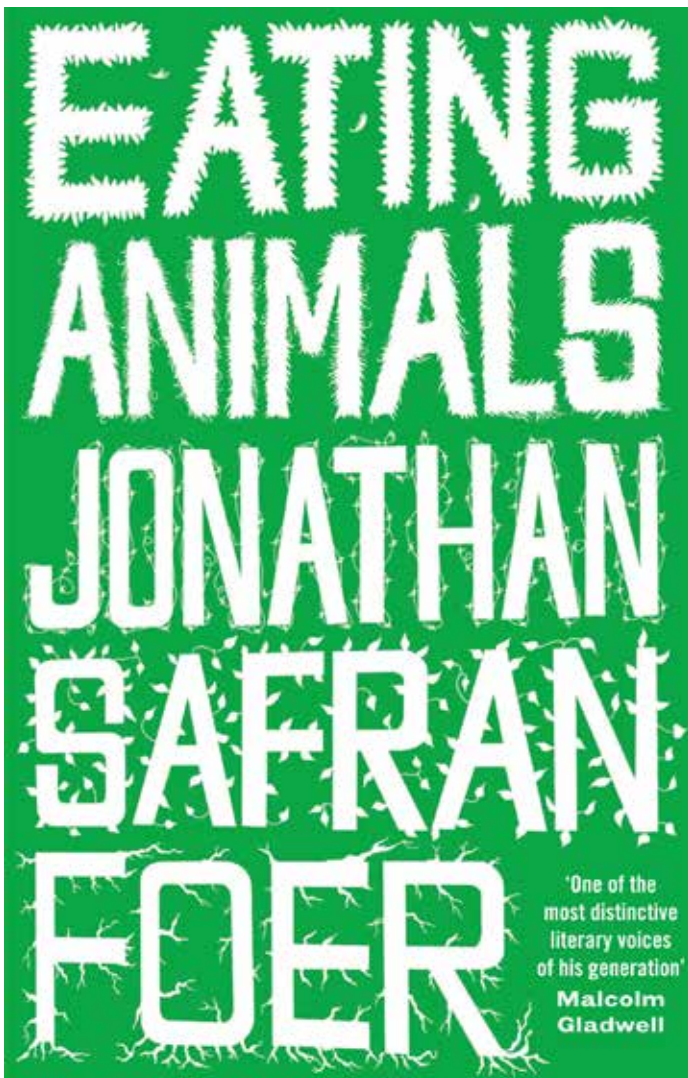
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Alaskan Pipeline by Kevin Abbott from sxc.hu

Spring Forest at Lake by Andreas Krappweis from sxc.hu



Eating Animals Book Review

By Helen Meskhidze

In *Eating Animals*, Jonathan Safran Foer presents his reader with a shockingly powerful and moving narrative about food. His narrative is prompted by his own experiences, questions, and the research he has done on the subject. Foer opens with the claim that food can be approached as a narrative, asking us to consider what this narrative says about us. What does it mean that we choose to eat turkey in celebration but cringe at the thought of roasted dog?

Addressing his concerns about factory farming and public health, Foer vividly details his visits to the places where the food we consume is being made, revealing how the systems we have in place today are totally unsustainable. He explores the real meaning behind labels like organic or free-range. In addition to addressing factory farming, Foer researches the fishing industry, highlighting in particular the little-acknowledged issue of bycatch. If the argument for sustainability is not convincing enough to rethink our systems, Foer provides an ethical supplement, in part by detailing the unethical slaughtering practices used by many farms.

Overall, Foer's witty and relatable narrative emphasizes that what is wrong with meat consumption is not eating animals, rather the way we are eating them. We cannot continue our unethical, unhealthy, unsustainable consumption, so Foer provides us with some alternatives. He notes that it is not necessary to become a full vegetarian—cutting back on meat consumption, in even just one meal, is a very good start. For the meat that we do eat, Foer believes it is okay to eat locally raised and slaughtered (or ethically raised and slaughtered) meat. Ultimately, Foer asks us to question our choices, to consider that if nothing matters, there is nothing to save.



Eating Animals by R. Fassbind from Shutterstock

Helen Meskhidze is a junior and physics and philosophy major with a minor in French. She is from Raleigh, NC. Helen is a member of Phi Kappa Phi, Pi Delta Phi, and Phi Eta Sigma honor societies. As an Honors Fellow and Lumen Scholar, she is conducting research in physics. Helen submitted her book review of *Eating Animals* because of the impact it had on her life and she hopes it will inspire others in a similar manner.

The Trail

Cutting a Path Through the Metaphors of Climate Change

By Avery McGaha

"I know nothing of ruling...I belong on the deck of a ship, not in a castle tower."

"You are a notable captain," the maester replied. "A captain rules his ship, does he not? He must navigate treacherous waters, set his sails to catch the rising wind, know when a storm is coming and how best to weather it. This is much the same."

Pylos meant it kindly, but his assurances rang hollow. "It is not at all the same!" Davos had protested. "A kingdom is not a ship...and a good thing, or this kingdom would be sinking."

—George R.R. Martin, *A Storm of Swords*

"The facts of nature are what they are, but we can only view them through the spectacles of our mind."

—Stephen Jay Gould

I'm up at seven again this morning, and I've already strapped my machete on backwards. The soft orange light of this unfamiliar hour, delayed in part by the two modest peaks close outside, makes even pulling on my boots a haphazard pre-coffee affair. I remove my belt and try again. Carefully, this time without my clumsy gloves, I thread it through the black woven sheath. The gurgle of the coffee maker dies a little, and then quiets all at once. A mug—no, a bigger mug. Between sips I stuff my pack with the necessities: pink and orange flagging tape, a purple mess of climbing rope, an old handsaw, a hatchet, and a peanut butter sandwich. A good day's work is ahead, so I drink the brew down as fast as I can manage. It wouldn't be the first time this week, if she came down to feed the dogs right now, for my mother to catch me at this awkward yet very manly moment: gulping a pint of coffee, knives in every other pocket of each wool jacket, clutching a pack full of steel weapons and neon tape, with a machete hanging like a longsword from my belt.

The air is hushed, though, the smoke from the wood-fired boiler growing thin from a restless night's work. Gloves? Gloves. Hat? Hat. I force open the frozen door, and at last I'm off into the woods. It's become a ritual now, as often as I can escape college to visit our new home—a decrepit but cozy cabin, resting low in a holler, between two rhododendron hills that surround a long and elegant waterfall. Wouldn't it be nice, I thought three long months ago, if we could walk around up there? And so today, once again, I'm building The Trail.

Well me, and the tan greasy-brownish companion I forgot to wake. Back to the cabin I creep, careful not to catch my oversized pack on the door, on the chair, on the counter, as I tip-toe back inside.

"Reba!" I whisper into the smoky shadows, past the half-built floor leading to her room. Tags clink and clank in the dark, faster and closer until she slams into my kneecaps and paws her way up to lick my beard—our usual early morning dance. By now it's almost eight.



Snow White Giant Winter

“Come on!” we say.

Past the aimless bumbles and gurgles of the creek we climb, walking and panting quicker to get warm. I find some branches I missed the day before, and give them a thoughtless whack! as we go.

A patch of leaves crunches fretfully somewhere to the right and I whirl around. Reba, resuming her habitual gargoyle pose, gives me a condescending head tilt. *You’re going to slice me in half.* Fine. I ram the machete back into its duct tape sheath and start back up The Trail, my thoughts drifting weightlessly with the orange morning fog.



If you tried to pinpoint its origin you’d be hard-pressed to nail down an exact date or a specific inventor, but Spain sometime during the confluence of agriculture and metalwork gets you close enough. The word “machete” comes from Spain a little before the sixteenth century, and it is said to transform the same Latin root of its macho relatives: the mace, the mallet, and the sledgehammer. The connotations aren’t exactly sisterly, since trying to bash a thicket in half as if your machete were Thor’s hammer is, I’ve found, not the most effective use of calories. But the machete’s handiness in demolishing foliage surely makes it the metaphorical sledgehammer of the wilderness.

It is a pretty menacing tool, I’ll give you that. In fact, I can almost see the little guys quaking before I cut them down—sometimes with a quick slash, sometimes a methodological flay. And if the angle is sufficiently frustrating, or the limbs especially thick or guarded by crazed, decaying hemlock, I end their brief tenure in this stage of living with a jagged hacking fury. After all, The Trail has to be built—and a little rhododendron (or if we’re being honest, a near-impregnable fortress of rhododendron) isn’t going to stand between my jungle-Gladius and a future of placid, contemplative nature walks through the woods around my cabin. Obviously, the machete inspires some violent behavior, in that one must continually hack and parry and cut around as if one were leading some Great Battle of The Rhododendron Hordes, and one’s language simply follows suit. Regardless, the machete is supremely effective at cutting small and tangled plants.

No surprise then that this Spanish farm implement eventually slashed its way from the Old World to the jungles of South and Central America, where machetes infiltrated into daily use. And so they remain even hundreds of years later—clearing jungle brush to collect food, build farms or cut roads through the forest. Beyond the machete, however, you’ll find almost exactly the same tool across the thick forest or agricultural subsistence regions of the world: whether it be a *panga* in East and Southern Africa, a *bolo* in the Philippines, *parang* or *golok* in Malaysia and Indonesia. In all these places and *more*, hardy, down-to-earth folks have been chopping up branches and crops for ages. In a way,

slicing apart a rogue tendril from that rhododendron hydra on my hill connects me to this noble tradition.

Just look at it. About two and a half feet long, a soft black like my scuffed and beer-stained guitar case. Sharp along the curved edge, duller and a bit wider at the top. It’s got a nice weight to it—easy to hold up, a good amount of force coming down. As long as your stance is right, and you’re not aiming at a rock or a spider web, a quick *shing!* at a generous 30 degrees will cleave that leafy menace in two. Opposite the business edge, on this model anyway, is a sort of chimera situation with a saw blade. Given its supreme ineffectiveness as a saw, this part is presumably intended to either inspire great care or piety in the face of impending ocular mutilation; forget to wear your safety glasses and the thing bounces off that briar and collides with your face.

And, like most mental tracks I try not to go down, I find I’m too late. There’s also another side to this tool, in a way darker sense: like how machetes are insidious weapons of dismemberment and murder. Almost a decade ago now, over 800,000 people were hacked to death in the streets, gardens, and churches of Rwanda—at the hands of their neighbors, their friends, their countrymen. In the wake of this savagery, as Jason Stearns recounts in his book *Dancing in the Glory of Monsters*, millions of refugees, Inter-hamwe militias, and the former Rwandan armed forces fled to neighboring Zaire (now the Democratic Republic of the Congo). This human flood in turn spawned a decade of wars, massacres, sexual violence and inevitable retaliations that claimed over five million lives. Now that I think on it, the machete feels a little heavy.

But The Trail must be built. I take a deep breath of thin, chilled Carolina mountain air. A moment’s pause brings the iced breeze again to my back. I recall my purpose behind the tool, which, on my brief and tenuous scale, is both ancient and unsure: something like cutting a broad swath and shaving close. Something like being a plain member and citizen of this woodland hillside like Aldo Leopold. Something like learning Rachel Carson’s humility before vaster forces, or impersonating Wendell Berry’s “fox / who makes more tracks than necessary, / some in the wrong direction.” Be careful—I remind my meandering self. Deciphering the nuances of great environmental metaphors could get a finger *shing!-ed* off, or an eye sawed in half. So I settle my footing away from a green rotted log and I dig firmly into the dark, crunchy soil. I visualize the generous 30 degrees, and, for a time at least, The Trail snakes on.

In truth, it’s the quietest my head has been in a year. I’ve spent the last eighteen months imprisoned in the dark intellectual labyrinth of global climate change, studying not only geoscience, atmospheric and ocean chemistry, marine, polar, and rainforest ecology, microbe and conservation biology—but also national and international policy, economics, psychology, social behavior, the last half-century’s environmental movement, and the attempts to communicate all this to a range of audiences.

This is an inflated way of saying that I sat around and read about 75 books—some on climate change, some narrowly or explicitly unrelated—while my coffee addiction became increasingly debilitating and my insufferable atmospheric anecdotes became a ratcheting weight on each of my declining, though much better informed, personal relationships. But not all the affects were so positive.

For instance, since I read and James Geary's clever book on metaphor *I is an Other* (and the work of the language scientists Steven Pinker, George Lakoff, and Mark Johnson) I can't shake the screaming burden of awareness about metaphor's elemental role in communication. What's more, apparently "metaphor is about more than just words. We *think* metaphorically. Metaphorical thinking is the way we make sense of the world, and every individual metaphor is a specific instance of this imaginative process at work" (10). And now I am forced to spot implicit comparisons hiding everywhere. This whole business is maddening by itself, ("Metaphor is always *breathing down our necks...*") and the inanity only compounds when paired with my recent scholarly obsession: popular books on climate change, which is by all accounts the most metaphor-laden, figuratively confused area of discourse imaginable. We're told by anyone with a MacBook that there are no silver bullet solutions. Climatologist David Archer says the climate is a bathtub; for geophysicist Henry Pollack, glaciers are pancakes. To Brian Fagan in *The Long Summer*, our rising vulnerability to extreme events makes us more a supertanker than a small fishing boat against a great wave. The effortlessly folksy Bill McKibben finds the most transcendent metaphor of all, which is all at once compelling, realistic, and entirely false: that since the times when we first glimpsed the earth from space, we now live on a *completely different planet*—"Eaarth," he calls it.

As stupidly plentiful as these metaphors are, McKibben gets the sentiment especially right: our language has absolutely no place for what is going on, save in metaphorical terms. Take a glimpse at the National Climate Assessment,

or the World Bank report "Turn Down the Heat." Or read the PwC report and others which show us sailing by the 2°C of average warming limit set down in the Copenhagen Accord, which is the scientific consensus of where we should never go beyond, and well on to 4-6°C by the end of this very century. Despite the last year of horrific severe weather events in the United States (Hurricane Sandy, devastating droughts, record wildfires, once again one of the hottest years on record), the whole of it could never match our daily experience—yet all of it "unequivocally" true or likely impending.

Enter James Hansen, former director of NASA's Goddard Institute for Space Studies, and a veteran climate scientist. In addition to his high-profile testimonies in congress, Hansen is known for being arrested on several occasions in actions of mass civil disobedience aimed at highlighting the accelerating stakes and urgency of climate change. But he's also a prolific writer, composing quick pieces for newspapers in addition to solid scientific papers for *Nature* and *Science*. In an op-ed for the *Washington Post* last year, he spoke about the implications of his colleagues' most recent work:

Extremely hot temperatures covered about 0.1 percent to 0.2 percent of the globe in the base period of our study, from 1951 to 1980. In the last three decades, while the average temperature has slowly risen, the extremes have soared and now cover about 10 percent of the globe...This is the world we have changed, and now we have to live in it — the world that caused the 2003 heat wave in

Europe that killed more than 50,000 people and the 2011 drought in Texas that caused more than \$5 billion in damage. Such events, our data show, will become even more frequent and more severe...The future is now. And it is hot.

So Bill McKibben, a close follower of Hansen's impressive scientific record and fellow jailbird on several occasions, describes climate change as "the biggest thing that's ever



Bushwacker

happened.” In a way, he’s right—none of this has happened on earth in the ten thousand years of human civilization. Though a close reading of Carl Sagan’s *A Pale Blue Dot* or Stephen Jay Gould’s collection of essays on natural history *Bully for Brontosaurus* certainly puts this exaggeration into perspective. But how else to talk about it? Gould reminds us that our minds work “largely by metaphor and comparison, not always (or often) by relentless logic.” Sometimes these metaphors necessarily overlap and collide. Sagan’s “pale blue dot” does at first seem rather incongruous with McKibben’s new-planet metaphor, but each has its uses: the first shows us our profound insignificance, the second our immense and inescapable significance. It’s the beautiful kind of paradox that, if you’re not careful, could easily get your finger *shing!ed* off.



I soon feel tightness clenching the muscles of my sword hand, and my throat drying cold, so I thrust the machete point into the dirt. The frozen earth rejects it altogether, the Janus-faced tool clanking awkwardly to the side. A long and glorious gulp from my Nalgene, and I suck the spring water well passed first sticker (“Local Food!”) and on towards the next (“Love Our Mother”). But now that I send my gaze along the ridge, I can spot the orange flagging tape wrapped around a boisterous mountain laurel, and I know I’ve almost connected the western leg of The Trail to the eastern path. An old logging road once wound along the edge of the hill, long before we moved out here this fall. Both ends of the path were easy enough to find, though time had indiscernibly swallowed the middle—such that any attempt to forge through one end meant a predictable marooning somewhere in the middle of a thorn paradise. So I was reduced to connecting the two points somewhat randomly, *à la* Transcontinental Railroad. Only, this endeavor wouldn’t end with a golden spike; if I remembered to pack it, I’ll close the gap with a peanut butter sandwich and one final *rhododecapitation*.

As I reach again for the machete, in my head I loudly curse James Geary for my metaphorical burden of awareness, as it highlights a slight discord in my thinking. While *rhododecapitation* harkens a sturdy and Spartan-like image, I think, the word does seem to be at odds with my particular quest. Instead of driving life into a corner—which one could hardly accuse me of doing here on this ridge, approximately 10 feet off the ground and, as we’ve discussed, thoroughly blanketed with plant protection—rather, I had sought the facts most astounding and most real, not communicated man to man. I sought to remind myself that even a bookish college student can’t just sit around and quote Thoreau; one must sometimes get out into the cold air and build The Trail—to live a bit without having to go Chris McCandless.

But the belligerence in my language reminds me again of the very real and present violence bound to this tool: of the Rwandans and Congolese in mass graves, of the victims of drug cartels in Central America, of severed elephant tusks in Kenya’s Tsavo National Park. The more I figure it, the heavier this flattened blade becomes, the less attractive and innocent, and the harder it becomes to reconcile a desire to hack the sprouting trees for my convenience with the mindset implied by Rachel Carson’s timeless imperative: one must not turn the weapons of war against “the fabric of life.” It would be silly, and indeed scientifically ignorant for me to compare chlorinated hydrocarbons to an inert hunk of steel, or a rhododendron sapling to a human being, wouldn’t it? But it may yet be constructive to draw parallels in the consequences of certain cognitive framing.

For example, the environmentalist in me might be devastated to find that my actions had tipped from *building* The Trail to making *war* against it: from trimming back a ubiquitous denizen of the hill so my mom and my dogs could know its delights a bit easier—to strapping myself with weapons and forcing The Trail along exactly where I please. As Stephen Jay Gould writes in *Bully for Brontosaurus*,

When we are caught in conceptual traps, the best exit is often a change in metaphor — not because the new guideline will be truer to nature (for neither the old nor the new metaphor lies “out there” in the woods), but because we need a shift to more fruitful perspectives, and metaphor is often the best agent of conceptual transition.

My cause may be pedestrian, but perhaps transposing the same conceptual trap onto another important discussion might illuminate a mental exit or two. And what’s more important than the “biggest thing that’s ever happened”?

“One must not turn the weapons of war against the fabric of life.”

In his book *The Great Disruption*, Paul Gilding foretells of what he sees as an approaching societal enlightenment and economic shift—“the Great Disruption”—in proximate response to the challenges, threats, and opportunities brought on by climate change. His most compelling arguments are drawn from parallels with World War II: we also knew about Hitler way before we acted appropriately, but we eventually got our act together and changed our lifestyles, our jobs, our production and consumption, and indeed our entire society more or less overnight to combat the impending threat; and so shall we respond to climate change. But the *language* of war is also used to flesh out and describe solutions, especially in his chapter titled “The One-Degree War.”

Consider also Michael Mann’s *The Hockey Stick and the Climate Wars*, Gwynne Dyer’s *Climate Wars*, Harold Welzer’s *Climate Wars*, or Eric Pooley’s *The Climate War*.

Consider even Bill McKibben in *Eaarth*: “But we will keep fighting, in the hope that we can limit that damage. And in the process, with many others fighting similar battles, we’ll help build the architecture for the world that comes next...” (212). Perhaps the penultimate example of war rhetoric comes from a recent petition to the White House, with thousands of signatures, vaingloriously titled “Declare War On Climate Change. We demand President Obama and Congress accept Climate Change as an Enemy of the People.” The Commander-in-chief’s response?

And that’s why, today, I’m announcing a new national climate action plan, and I’m here to *enlist* your generation’s help in keeping the United States of America a leader—a global leader—in the *fight* against climate change. (Randall)

So in popular imagination at least, climate change is a war. It’s a *fight* against the fossil fuel industry, against Filibustering Republicans, against the Chinese and Indians who are burning through coal like bullets from a Gatling gun. It’s about producing *fleets* of more efficient vehicles, of solar panels or windmills. In fact, the cover for the documentary film *Carbon Nation* shows men in hardhats hoisting up a windmill, imitating the iconic Iwo Jima photograph of soldiers lifting Old Glory after one of the bloodiest battles of the Pacific. These images set the mental framework of war around climate change, which provide us with a sense of urgency and empowerment toward a common goal, as well as a clear distinction between allies and enemies.

Gilding and McKibben in particular draw some interesting parallels with World War II, which may be useful when thinking about how to deal with the fossil fuel industry’s inane assaults on equity and reason through buying politicians and spreading false information. Indeed, over the last three decades climate scientists like James Hansen and Michael Mann have had to seriously *dig in* and *defend* their important, rigorous work against all kinds of industry-funded craziness. The actual crisis of World War II, and how we retooled the American economy at breakneck speed, might also actually offer some hope. If we shifted so radically then, from building cars to tanks and planes, we might be capable of making a hasty transition from fossil fuels to renewable energies. But, as David Roberts at *Grist* notes, such speed will require investing more power and responsibility in an increasingly centralized government. With an implicit critique of the war metaphor, Roberts questions how far this should go:

Among the many dangers in this approach is that executives are not generally inclined to give up power once it’s been granted them. And it’s not like the climate situation will be any less dire in 10 years, or 20. Once you switch over to wartime government in the face of a foe that cannot surrender and never stops, how do you ever switch back? (Roberts)



Cresting Static Peak by William Stirn '14



Then, to remind us of the consequences of wartime actions—and indeed wartime thinking—Roberts adds a sobering aside, “The parallels to the ‘war on terrorism’ should be obvious here.”

It seems obvious that the Second World War and even the illusory “war on terrorism” don’t match climate change perfectly. But even a traditional kind of war is largely beyond our suburban, Starbucksian conceptions of it. Perhaps the grit and nuance of the Congo war, the “Great War of Africa,” as Stearns describes in *Dancing in the Glory of Monsters*, might serve as a better metaphor for climate change as a whole—in this case more compelling parallels may arise from our relative unfamiliarity. It was a fractured series of wars fought by dictators and university professors, guerilla fighters, genocide victims and perpetrators alike, by children and hired guns, foreign leaders and elephant poachers, by dozens of splintered movements and revolutions and resistances, by Kalashnikovs, cargo planes, bank accounts and the machete. Is the struggle to reduce our own emissions not as twisted, as particular and bizarre, as aimed at our own neighbors and indeed our own selves? Stearns writes,

The Congo war had no one cause, no clear conceptual essence that can be easily distilled in a couple of paragraphs. Like an ancient Greek epic, it is a mess of different narrative strands—some heroic, some venal, all combined in a narrative that is not straightforward but layered, shifting, and incomplete. It is not a war of great mechanical precision but of ragged human edges. (336)

As the future Bangladesh becomes more certainly an Asian Atlantis, as droughts and floods get worse and more frequent in neighboring India, as more frequent and violent wildfires and hurricanes burn our forests and sink our coastal cities, as meaningful legislation continues to fall through on the national and international level—and as the rich move inland and the poor get fewer and fewer calories—this particular war becomes less of a unified battle against totalitarianism and more a war of “ragged human edges.”

These deeper similarities provide a good reason to think of climate change like a twisted modern-day war, but using war rhetoric to stir motivation is far from the only path to compelling communication—or to exploring deeper questions. Take for example climatologist Curt Stager, in his enthralling *Deep Future*, as he prescribes conditions for solving the climate crisis:

The better we know and respect one another, the more likely we are to understand each other’s needs and goals, and the more likely we are to cooperate effectively for our mutual benefit... The smartest and most ethically sound solution is to pause, listen to one another carefully and

respectfully, and then try to move together as a single species on our singular planet. (233)

Or Australian scientist Tim Flannery, in his beautiful book *Here on Earth*:

Infancy is the most dangerous period of life, and the threats to our global civilization that must be faced during this century of decision will provide challenges enough, I think. But in some future age, if our world is healed, our population stable and a sustainable lifestyle established, the focus of our superorganism will perhaps shift to the heavens...But I am certain of one thing—if we do not strive to love one another, and to love our planet as much as we love ourselves, then no further human progress is possible here on Earth. (279-281)

Flannery instead compares humanity to an infant, and our crises are all dangers that come along with that stage of life, with the hope that humanity reaches beyond it. It's less of a black and white *tactic* to stir emotions, and more of a *strategy* to endow readers with a larger perspective: to think beyond the pettiness of energy politics and glimpse a wider view. Beyond that, Flannery and Stager both speak about “listening,” about coming to terms with the past, about healing and stabilizing, unifying focus, about the “most ethically sound” solutions, “mutual benefit”—about love. Instead of war, they are using the language of peace.

And as we should know, a lasting peace cannot be reliably waged; it must be built. As Stearns concludes:

[Peace] demands that all involved think hard. This means diving into the nuts and bolts of Congolese politics and helping the more legitimate and responsible leaders to the top. This means better, more aggressive, and smarter peacekeeping and conflict resolution; more foreign aid that is conditional on political reforms and not just on fiscal performance; and more responsible corporate investment and trade with the Congo... [Not] imposing a foreign vision on the country or simply sending food and money. It means understanding it and its politics and rhythms on their own terms, and then doing our part in providing an environment conducive to growth and stability. (337)

His conclusion echoes Steven Pinker in his massive study of human violence, *The Better Angels of Our Nature: Why Violence Has Declined*. To build peace, societies must strengthen institutions that are empirically bound to real, measurable overall reductions in violence compared to the long and deadly course of human history: institutions like free speech, commerce, human rights, rule of law, science and reason. These, he argues, have been shown to produce in the long run, in Stearns's terms, “an environment condu-

cive to growth and stability.” To build a lasting peace, our societies must restrict the facets of human nature that incline us towards violence, like superstition and dominance, and promote those “better angels of our nature,” like reason, empathy, and self-control which steer us away. If we transpose the ideas of peace onto climate change instead, who knows what we might learn—or what might suddenly become possible.



So is the metaphorical solution to the climate crisis some kind of war—or the end of one? Does it only require troops and machines, retribution and ideology? Environmental author and entrepreneur Paul Hawken seems to think not: “We are surfeited with metaphors of war,” he says, “such that when we hear the word *defense* we think *attack*, but the defense of the world can truly be accomplished only by cooperation and compassion” (165). There cannot be any doubt that solutions must also partly be in Stearns's “political reform” and “responsible corporate investment”—as the thirty years of fierce resistance and denial by the powerful puppet masters in the fossil fuel industry have made painfully clear. But perhaps it also requires reconciliation and justice? Reasoned dialogue, active maintenance, common understanding? Maybe our institutions could reflect, as McKibben wrote in *The End of Nature*, that “we are different from the rest of the natural order, for the single reason that we possess the possibility of self-restraint, of choosing some other way” (xx).

And is not the urgency conveyed by the language of war just as implicit in calls for peace? Perhaps a peaceful climate requires both lines of thinking, or neither. Maybe our climate crisis is more like Flannery's teething babe?

Ah well—forget it. The work is done, for now, and the icy sun has passed beyond the old poplar and through the thin fingers of the tallest dying hemlock. By now I've thought myself in a circle, and I'm not much closer to any profound answers. That's the trouble with thinking your way into something: it's hard to get out once you've gone in, and you can't reasonably expect to escape with much else than what you brought in with you. “The facts of nature are what they are,” Stephen Jay Gould reminds, “but we can only view them through the spectacles of our mind.” The machete is, after all, just a hunk of metal, and I a hunk of flesh. It is a tool with a dual legacy: a history of gross human violence, but also a good deal of chopped vegetation. Maybe not all connections are useful.

But perhaps Gould's words underestimate The Trail; for though “neither the old nor the new metaphor lies ‘out there’ in the woods,” there may be no clearer place to judge which mental spectacles to wear. Through aching hours I reclaimed the logging road; I built my own conditions for peace outside, for sunny walks and a reminder of my shifting place. Maybe causing some inconvenience to a few rhododendron shoots does not desecrate Rachel Carson's

memory, or Thoreau's, or Leopold's. Even Wendell Berry might give a sagely nod to my small way of learning affection for my new place. "Affection leads," he says mystically, "by way of good work, to authentic hope"—something one could certainly accuse me of seeking (35). Now I will have to maintain The Trail in the face of tumbling soil and budding trees, and those that live after me will have the same basic choice.


Maybe not all connections are useful, but perhaps some are inescapable. Indeed our success in creating a sustainable future may lie in how far we are willing to trace connections: will we continue to see fossil fuel companies as profitable and necessary investments? Or might we recognize our responsibility in this new future, refuse to cash in on the measurable wrecking of ecosystems, communities, and human lives?

Perhaps to see how ideas connect with these facts of nature one must not only change spectacles, but clear away a thick nest of metaphor—or at least begin to cut some semblance of a path. The thicket can so easily swallow the meaning in the middle. Sometimes you do need a golden spike to connect the paths, but sometimes you just need a machete or stack of books. Maybe you need some flagging tape, maybe you need a map, a sandwich, or a friend you overlooked. Sometimes you need to build [The Trail](#).

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Thoreau, Walden Pond, and Sacred Space

By Garrett Welshofer

Thoreau's writings at Walden Pond divulge a change in the man's character through documentation of experiences and his own personal critiques of the society he left behind. Many critics and admirers of Thoreau each focus on his consciousness of thought as a message meant to be delivered to society and learned from. However, these observations are superficial at best and if the writings are alternatively viewed through a lens into the mind of Thoreau's consciousness, what is revealed is the masterpiece of transformation of one's character through an interaction with a self-proclaimed sacred space. While many would cursorily see the sacred space as Walden Pond, the true sacred space is within Thoreau himself.


Mircea Eliade excellently defines sacred space and both its placement within the modern world and its origins, both of which are highly relatable to Thoreau and his views of Walden Pond. What Eliade concluded was that for a non-spiritual person, the world is but a uniformity. But for the spiritual and religious person, the world has a division between the sacred and the profane. A sacred space, claims Eliade, can be claimed after religious happenings or, more modernly, be claimed based on personal associations of the proclaimer, such as a birthplace (Eliade). It is no question that Thoreau sees Walden Pond as a sacred space. Thoreau even forthright spoke of its sanctity when he said, "I discovered that my house actually had its site in such a withdrawn, but forever new and unprofaned, part of the universe" (Walden 170). It is interesting to see that Thoreau views the withdrawn nature of his housing as being the cause of the sanctity. Thoreau's personal associations with Walden are not as evident, especially with denoting Walden as sacred early in his writings. Alternatively, it wouldn't be unreasonable for Thoreau to see sanctity after his clear

transformation at Walden. His identification of the sacred and profane further lines up with Mircea Eliade because of his spiritual and religious nature.

Another association that Mircea Eliade makes to that of a sacred space is the idea of the sacred center whose attributes Thoreau often attributed to Walden Pond itself. Throughout history, the center of the world was considered the most sacred because it was the point on the Earth closest to the divine heavens (Eliade). This idea was carried out in almost all religions and can be seen today in Jerusalem, considered by most monotheistic religions to be the center of the world. Jews consecrated this location with the Temple of Solomon on the temple mount. The Christians used an idol as a marker for the navel of the Earth, the Omphalos, which currently resides in the Church of the Holy Sepulchre, considered to be the place of Golgotha and Jesus's death. Walden Pond's location, and nature in general, was described in great detail by Thoreau as a place close to the heavens and divine in nature. "Olympus is but the outside of the earth every where" (Walden 168). Choice words being that Olympus was the house of the gods in Greek mythology and the location to one of the oldest Omphalos in human history. Thoreau also describes Walden as the "earth's eye; looking into which the beholder measures the depth of his own nature" (Walden 243). That Walden Pond is called the eye of the earth can be further interpreted as a singularity of the earth and from that assertion, perhaps a center. Lastly, Thoreau speaks of the pond as having celestial properties when he wrote, "...obtained a patent of heaven to be the only Walden Pond in the world and distiller of celestial dews" (Walden 238). From this written evidence, it is possible to see a Walden Pond that Thoreau viewed quite possibly as the center, perhaps not the entire world, but of his world and what he personally saw as sacred space; thus making it an almost religious and celestial spot for himself, similar to Eliade's concept of the Omphalos.

Eliade's idea of the sacred threshold is one that is clearly defined by Thoreau through both physical and metaphysical means. Eliade describes the threshold as the boundary between the profane and the sacred (Eliade). His interest

“While many would cursorily see the sacred space as Walden Pond, the true sacred space is within Thoreau himself.”



is in what causes the difference between literally inches of space and what defines that boundary. For Thoreau, this boundary as a physical entity is both well-defined and ambiguous simultaneously. Thoreau's sacred threshold is the boundary between civilization and the natural world. He undoubtedly sees nature as a space of beauty and enlightenment as he states "life emits a fragrance like flowers and sweet-scented herbs, is more elastic, more starry, more immortal" (Walden 166). He also sees great deficiency with human society as stated: "The greater part of what my neighbors call good I believe in my soul to be bad" (Walden 113). However, the boundary between the two is not as clearly defined as an unread man thinks for Thoreau also speaks fondly of manmade intrusions into nature such as the railroad and deforestation. Eliade would disagree that it is not even a remote possibility for a profane space to enter into the sacred space because the threshold must be upheld at all times. However, Thoreau placed another threshold during his time in the woods and that is his mental threshold. Thoreau abstained from sex and other pleasures of the mind to create a mental sanctity of sorts, which he wrote about in *Higher Laws*. This mental threshold was maintained throughout Thoreau's life and indeed does fit Eliade's criteria for a sacred threshold. In fact, it is possible that Thoreau's consciousness much better fits all criteria for a sacred space than does Walden Pond. Walden Pond is a preoccupation that one might originally see as Thoreau's sacred space but is just a distraction from the real sacred space that is Thoreau's consciousness.

One way to view a sacred space is as an *imago mundi* that does not necessarily coincide with Walden Pond and leads one to believe that the sacred space of the Thoreau-wilderness dichotomy is actually Thoreau himself and

not nature at all. *Imago mundi*, according to Eliade, is the cosmic order created from chaos in the form of a construction. The most widely used example is a temple: a place where the chaos of the un-divine was made divine through order (Eliade). However, it is easy to see that the typical idea of *imago mundi* does not as easily apply to Thoreau's situation. The wilderness is the exact opposite of order within chaos and scientifically speaking, according to the third law of thermodynamics, wilderness is constantly moving towards more disorder versus civilization that is organization within chaos. From that viewpoint it is difficult to see Walden Pond as order within a disorganized and profane world. Again, it is within Thoreau himself that the organization takes place. It can clearly be seen that a change takes place within Thoreau over the course of his time at Walden Pond. For example, there is a clear increase in extrospection which can be seen through his decrease in his use of the word "I" within his writings and an increase in the word "Walden" (Buell). Thoreau comes to terms with himself and finds an inner peace of sorts while at Walden Pond. Organization takes place in his mind, as he is able to find a lesser form of enlightenment while within the chaos of the wilderness. Further analysis of Thoreau's nature leads one to see the truth in him being his own sacred space that fits all criteria of what a sacred space needs to be.

Critical analysis of Thoreau's person reveals that the true sacred space of Thoreau lay not at Walden Pond, but with Thoreau himself and his own consciousness. For example and to digress, Thoreau clearly labeled the sanctity of his home as residing in its withdrawn nature. However, maybe it was not the withdrawnness of his home, but rather the solitude of his mind and thoughts from the society he so heavily criticized that was creating an inner sanctity. This



Peaceful Lake



Autumn at Thoreau's Walden Pond

sanctity being something that Thoreau himself mislabeled as an external source, Walden Pond, because his extrospective character developments. Secondly, and to digress again, Thoreau did speak highly of Walden Pond and perhaps even made some hints that he viewed the pond as his centrality for his own personal sacred space. But, revisiting the quote, "earth's eye; looking into which the beholder measures the depth of his own nature," the emphasized importance of Walden Pond comes from it causing the beholder to measure his own nature. However, historically centralized sacred spaces are important simply in and of themselves and their closeness to the heavens. This quote draws away the attention from Walden Pond as the sacred space and emphasizes Thoreau's consciousness as sacred instead. Walden Pond is merely a portal to create the infrastructure within him. If this is the case, further speculation might lead to the idea that there is no sacred space anywhere other than one's self. The idea of the Omphalos still exists, however, but with the centralization of sacred space being non-geographical. Is not every conscious mind a centrality of its own from which we all perceive the universe circling around us? And is not the closest every man can get to the heavens come from his faith and not his location? Lastly, Thoreau clearly sees modern life as the profane and societal habits as the profanity of the mind. This is true even down to his opinions of land ownership and education. Walden Pond simply acts as a medium to organize his mind from profane to sacred. This concept is something everyone can relate to: a place where one finds inner peace. 🙄

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If I Could Change The World

A Call to Reduce Greenhouse Gas Emissions Produced by the Transportation Sector

By Shannon Temlak

Growing up in Fairfax County, Virginia, I participated in a partial immersion program in which I learned math and science in the Japanese language. Years later when I first received news of the 2011 Tohoku earthquake and tsunami, my stomach churned. I could not help but contemplate how the accident at the Fukushima Daiichi Nuclear Power Plant would have detrimental effects on the environment and serve to influence public policy pertaining to nuclear energy around the world. My early exposure to the Japanese culture helped me understand that what happens in one community affects what happens globally. Every behavior we engage in and every choice we make as individuals and as a collective society has implications for the international community. Therefore, the ways in which people utilize transportation contribute to worsening the transnational environmental issue of climate change.

The population density of urban areas has grown substantially over the past several decades. The number of urban residents across the globe grows by nearly sixty million every year (WHO 2014). Looking to the high-emitting transportation sector, it becomes clearer why cities produce up to seventy percent of global carbon dioxide emissions (WRI 2014). The thirty-four percent increase in travel miles by passenger cars and light-trucks between 1990 and 2011 can be attributed in part to population growth and urban sprawl (EPA 2013c). If I could change the world, I would develop and implement effective transportation policies to alleviate the effects of urbanization and ultimately address climate change.

In my home state of Massachusetts, carbon dioxide emissions continue to rise as each resident takes approximately four trips per day and take sixty-eight percent of trips by automobile. While seventy-two percent of Massachusetts commuters drive and just fewer than thirteen percent take public transit, only five percent walk (MassDOT 2014). Transportation accounted for twenty-seven percent of U.S. greenhouse gas emissions in 2011 and is the second largest sector contributing to GHG emissions (EPA 2014a). In Massachusetts alone, fossil fuel combustion from transportation resulted in the emission of thirty-one million metric tons of carbon dioxide (EPA 2014b). The urgency to reduce greenhouse gas emissions signifies that U.S. municipalities should establish and

maintain transportation control measures that help attain air quality goals. A pedestrian plan is one such initiative that cities can use to meet this objective, yet few have them. If I could change the world, I would mandate

“If I could change the world, I would mandate that every U.S. city establish and implement pedestrian plans.”

that every U.S. city establish and implement pedestrian plans – plans designed to improve pedestrian circulation efficiency. It is important that U.S. cities become more walkable because traffic congestion from the multitude of automobiles and transit vehicles on roadways significantly contributes to air pollution.

By establishing and implementing pedestrian plans, U.S. municipalities can tailor to pedestrians’ needs and reduce reliance on vehicles for commuting, shopping, and personal business. Municipalities can consult pedestrian plans that are in existence for guidance. I recommend



Motorway at Twilight by Kevin Dowey from sxc.hu

the Cambridge Pedestrian Plan as a model because Cambridge, Massachusetts was named the best U.S. city for walking in 2010 due to how easy it is for people to travel to provisions and entertainment on foot (Cohen 2012). Each municipality would form a committee responsible for establishing and implementing a pedestrian plan. The committee would assess existing conditions and identify areas within the city that are ill-suited for pedestrians. City planners on the committee would use sustainable design standards and account for technological innovation in determining what infrastructure to use to make the city more walkable. This infrastructure would include lights, benches, trees, signage, crosswalks, and sidewalks. In this way, U.S. cities would provide residents and visitors with more transportation options and utilize measures that will elicit behavior change.

We cannot continue to live in a society that relies so heavily on automobiles. Revival of urban development and reduction of greenhouse gas emissions from the transportation sector is vital. Urban planners with specializations in sustainable communities are needed to help minimize urbanization's impact on the environment. I hope to join others pursuing this career path following my graduation from Elon in Spring 2015.

Shannon Temlak is a senior political science and policy studies major. Her Elon College Fellow research explores why the adoption and characteristics of climate policies vary across U.S. states characterized as high emitters of CO₂.

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