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Title: Nature in Chains: The Effects of Thomas Jefferson’s Rectangular Survey on a Pacific Northwest Landscape

Abstract approved:

Mary Jo Nye

Understanding the impact of humans on the environment has long been a topic of scholarly interest and debate. As environmental problems mount, accounts of historic ecological conditions and the factors of change become increasingly useful. This study considers competing schools of interpretation about human impacts on ecological landscapes and develops a case study of one thirty-six square mile township in Oregon’s Waldo Hills. Built on evidence from 1851 surveyor notes, maps, journals, aerial photos, interviews, and contemporary environmental and ecological data, this study demonstrates a transformation from ecologically diverse ecosystems under the management of native peoples to ecologically depressed monoculture landscapes under industrialized agriculture.

This thesis argues that the fundamental beliefs of human societies (i.e., worldviews) become expressed in the landscape. The nature-as-community view of the Kalapuya Indians resulted in a complex, curvilinear mosaic of prairie, savanna,
and woodland. The individualized and rationalized view of the Euroamericans resulted in a simplified landscape of squared-off fields, channelized streams, and roads aligned to the survey grid. Thomas Jefferson’s rectangular survey, built on the ‘virtuous square’, is examined as a symbolic and tangible instrument of rapid expansion and exploitation across the American West. Understanding that worldviews become expressed in physical conditions may benefit those working to create sustainable futures; i.e., long-term and widespread ecological improvements will likely succeed only if society at large shares a fundamental belief in the value of healthy ecosystems.
Nature in Chains:
The Effects of Thomas Jefferson’s Rectangular Survey on a
Pacific Northwest Landscape

by
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I understand my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

___________________________________________
Tina K. Schweickert, Author
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This thesis is more than the culmination of two years of intensive research and study. It has been built upon a lifetime of learning and experience; thus, it would be difficult to name all who have kindled the ideas and motivation for its development. Ideas, however, mean nothing if not placed within a coherent and defensible framework for others to consider and respond — a platform for the dialectic, which is so important to scholarly discourse. For this I can only thank my esteemed professors whose intellectual and professional expertise have guided every step, pointing out pitfalls while graciously accepting some of my most well-worn pathways of thought.

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To my husband, Frank Mauldin
Nature in Chains: The Effects of Thomas Jefferson’s Rectangular Survey on a Pacific Northwest Landscape

INTRODUCTION

When surveyor and Waldo Hills land claimant Timothy Davenport was working on the 1851 public lands survey in the Oregon Territory, he witnessed a gathering of Indians on Mount Tapalamaho, known today as Mt. Angel.1 A group of Willamette Valley Indians silently communed in a stone sanctuary erected there. From their stone seats, they could view the broad plain to the west, which the Indians called Chek-ta meaning “beautiful or enchanting.” As Davenport watched, he wondered what they were praying for, since they were not “in want of food, for the Abiqua [Creek] was swarming with trout; the valley was blue with the bloom of his edible root, the sweet camas; from every grove came the love notes of the grouse, and the mountains near at hand were populous with bigger game. He did not want for clothing for the fur that warmed the bear warmed him.”2 Davenport reasoned that they sought what all “tribes of men” seek in contemplative silence. But why pray here, on top of this mount, he asked. Their answer translated to him, “Because Sah ’-hah-lee Tyee, the Great Spirit, is nearer on the mountaintop.”3

Just south of Mt. Tapalamaho, American emigrants were at this time settling in the Waldo Hills — many claiming the hills were “unequaled for [their] beauty and

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1 This isolated mount is located just north of the township under study. It is in Township 6S Range 1W. A Benedictine monastery is now built on the site.

2 T.W. Davenport, “Extract from T.W. Davenport’s ‘Recollections of an Indian Agent’ (not yet published)” in Oregon Historical Quarterly 5 (March 1904), 36.

3 Ibid., 37.
fertility.”\textsuperscript{4} The town of Sublimity at the southern end was so named “for the sublime scenery” in the hills around town.\textsuperscript{5} But these qualities were created and maintained by the first people whose beliefs about land and its management conflicted with those who would claim it as their own. The native peoples’ way resulted in a landscape rich in biological diversity and complexity. The American way simplified the landscape through application of rationalism, utilitarianism, and the Enlightenment ideals of private land ownership, symbolized by the grid laid out by the first surveyors.

The biological abundance diminished as American ‘improvements’ called for cultivating land to grow imported crops and domesticated animals, as well as felling trees to provide fuel and lumber for building permanent settlements. The transformation continued as farming was mechanized through the twentieth century, especially after World War II, becoming increasingly industrialized and dependent on fossil fuels. Today the hills primarily support a monocultural landscape, growing crops for global markets, and playing a major role in Oregon’s natural resource-based economy. Over the course of the last one hundred and fifty years the “natural sublime of [this] American landscape was transformed into the modern technological sublime . . . a manifestation of modern progress.”\textsuperscript{6}

\textsuperscript{6} Gilbert LaFreniere, \textit{The Decline of Nature: Environmental History and the Western Worldview} (Bethesda, MD: Academica Press, 2008), 289.
The transformation of Oregon’s Waldo Hills is one subject of this thesis. This primary subject is set within broader historical themes on the relationship between worldviews and the health of natural ecosystems. The worldviews and land management practices of the indigenous people are contrasted with the Americans who immigrated to the Oregon Territory. Development of the American worldview began with the writers of the Declaration of Independence as men drew upon Enlightenment ideals that were sparked, in part, by the scientific revolution and revival of classical thought. Thomas Jefferson’s rectangular survey played a pivotal role in helping to define the nation’s emerging land ownership ideology as the country expanded westward. Chapter Two explores the genesis of Jefferson’s work and its impact on agricultural landscapes.

The thesis begins, however, by examining two trends in American environmental history: declensionism, the view that the expansion of Western civilization resulted in a decline from ecological stability to ecological decay, and postmodern deconstructionism, which maintains that concepts of nature, wilderness, and stable ecosystems are social constructions without solid ground and therefore should not serve as a basis for historical analysis. Both schools can claim support from scientific schools of thought and both hint at social and political biases. The purpose of the first chapter is to provide an account of this historiography, focusing on American Indian

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7 The qualification of ‘natural’ to describe ‘ecosystems’ is to distinguish the term from its contemporary usage applied to urban environments; i.e., “urban ecosystems”. See Understanding Urban Ecosystems: A New Frontier for Science and Education, Edited by Alan R. Berkowitz, Charles H. Nilon, and Karen S. Hollweg (NY: Springer-Verlag, 2003) and LaFreniere, The Decline of Nature, 16-18.
and environmental histories in order to consider different interpretations of the ecological transformation that occurred under management by native people compared to that of Euroamericans.

This thesis generally takes a declensionist approach, though not one that assumes a ‘pristine wilderness’ as the starting point. It is built on ecological and cultural evidence with a specific focus on changes in the landscape of one township on the east side of Oregon’s Willamette Valley in a region known as the Waldo Hills. The study considers the impact of Jefferson’s rectangular grid, while making particular use of the detailed survey notes describing the original 1851 public lands survey. A meticulous study of the surveyors’ notes describing the eighty-four miles they walked to survey the township led to a redrawing of the original township map in order to more precisely depict the historic vegetative and cultural conditions. The result is an aerial view of the landscape at the juncture between two distinctly different cultures — cultures with disparate views about the human relationship with land.

This narrative has been composed from a variety of primary and secondary sources. My interpretation of historical and ecological data is based on education and experience in the environmental sciences, including government policy and planning in forest and watershed management, threatened and endangered species protection, and agricultural water quality. I have lived as an amateur naturalist on 90 acres of land in the Waldo Hills for three decades — land that is evenly split between industrial management of grass seed production and the ecological management of a wildlife sanctuary. As a historian, I have used the historical
record gleaned from journals, aerial photos, maps, surveyor notes, ecological studies, interviews, the writings of Thomas Jefferson, Congressional records, and other historical narratives. The result is a construction and interpretation of a landscape that has received little attention from historians.  

We are taught in graduate school that our theses should answer the basic question, “so what?” What does the research tell us? What makes this historical narrative significant? What is it we are attempting to tell that has not been told before or is different from other interpretations? British historian Alum Munslow claims, “the historical narrative is not the past but a history.” It is a “flawed practice” to think that the historian’s inductive research data can be stitched together to correspond with the past such that it represents the truth. The historical narrative is therefore but “a representation of pastness.” Munslow suggests that the past is not “discovered or found” but is created and represented by the historian as a text, which is then consumed by a reader. In this sense, historians are not detached observers of history but active participants in its creation. The old “idea of truth being rediscovered in the evidence is a nineteenth-century modernist conception,” which has no place in contemporary historical narratives.  

Munslow’s thoughts provide a counterpoint to postmodernist thought that condemns ‘grand narratives’ and attempts to promote nihilistic objectivity. Munslow

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8 Robert H. Down’s *History of the Silverton Country* (Portland, OR: Berncliff Press, 1926) and James Habeck’s “The Original Vegetation of the Mid-Willamette Valley, Oregon” *Northwest Science* 35 (May 1961): 65-77 are specific to this region.
10 Ibid., 178.
upholds the strength of the historical narrative, within the appropriate context of its subjectivity, so that historical discourse is freed within the bounds of the historian’s honest attempt at accuracy.

Some historians believe environmental history has a strong tendency toward advocacy and that environmental historians should avoid this pitfall. Writing in 2001, environmental historian J. Donald Hughes claims that there is far less environmental advocacy now than existed previously in the field. Hughes attributed this to the suspicions leveled within the historical community that environmental historians were purposefully “promoting a point of view.” Such suspicions are far less warranted today as environmental historians “are just as likely to be critical of environmentalists as of their opponents.” Hughes follows the lead of environmental historian John Opie in reminding historians, however, that advocacy has certain virtues and that “to avoid it completely may be to dodge important ethical questions.” Hughes suggests that being effective and relevant should not mean being less committed to ethical responsibility. The narrative of this thesis is composed as an honest attempt at accuracy, as well as ethical responsibility, especially relevant at the start of the twenty-

first century, when environmental miasma looms large but constructive movement continues at “a snail’s pace.”\textsuperscript{13}

\textsuperscript{13} The reference to “a snail’s pace” is from Aldo Leopold’s “The Upshot” in \textit{A Sand County Almanac} (Oxford: Oxford University Press, 1966), 243. The full statement reads: “Despite nearly a century of propaganda, conservation still proceeds at a snail’s pace; progress still consists largely of letterhead pieties and convention oratory. On the back forty we still slip two steps backward for each forward stride.”
CHAPTER ONE: THE LANDSCAPE OF ENVIRONMENTAL HISTORY

When historian Frederick Jackson Turner announced in 1893 that the Western frontier “has gone, and with its going has closed the first period of American history,” many believed the history of the West had also closed.\(^\text{14}\) Turner’s “frontier thesis” was a definitive work on the history of the West, from the “Old West” (the back country of New England) to the far West—all the land that could be considered at one time to be the frontier edge for colonization and settlement. For Turner, the end of land for expansion did not mean that America’s quest for discovery should end, but rather it should be redirected “to widen the intellectual horizon of the people, help to lay the foundations of a better industrial life, show them new goals for endeavor, inspire them with more varied and higher ideals.”\(^\text{15}\) Turner used the frontier, and the making of America anew at its leading edge, as a metaphor for everything Americans had come to characterize. Here the ideals of discovery, democracy, and individualism were formed and should not be given up just because the “wilderness” and primitive land had all been “civilized.”

Turner’s defining historical narrative formed an American bedrock that was not easily broken. The whole and varied history of the West—from its native people to the influx of Europeans and beyond the “closing of the frontier” to the West’s strategic position in global trade—had yet to take root, although historians such as Henry Nash Smith (\textit{Virgin Land}, 1950) and Earl Pomeroy (“Toward a Reorientation of Western

\(^{15}\) Ibid., 310.
History,” 1955) planted the seeds.\textsuperscript{16} It was Patricia Limerick’s work almost a century after Turner that became the pivotal revisionist narrative on Western history. Her book, \textit{The Legacy of Conquest: The Unbroken Past of the American West} (1987), is widely considered to have captured the spirit of the “New Western History,” largely because it influenced public audiences far beyond the academic community.\textsuperscript{17} Alongside her were other leaders in Western history: Donald Worster, Richard White, William Cronon— together referred to as “the gang of four.”\textsuperscript{18}

The new interpretive framework allowed historians to view the West as a place with its own unique importance, distinct from its view from the eastern seaboard. The new view jettisoned old assumptions. The term ‘frontier’ was gone along with its nationalistic and racist connotations that only civilized whites mattered to history. The new narrative would acknowledge and examine the West as a place where people of different cultures, races, genders, and the land itself interacted over time. The new history of the West provided an opportunity for reexamining American assumptions and stereotypical beliefs about progress and the Westward Movement. The revised


\textsuperscript{17} Patricia N. Limerick, \textit{The Legacy of Conquest: The Unbroken Past of the American West} (NY: W.W Norton & Company, 1987). For an account of Limerick’s role in helping to revise Western history, see Walter Nugent “Western History, New and Not So New,” \textit{Organization of American Historians Magazine of History} 9 (Fall 1994).

\textsuperscript{18} Howard N. Rabinowitz, “The New Western History Goes to Town, or Don’t Forget That Your Urban Hamburger Was Once a Rural Cow,” \textit{Montana: The Magazine of Western History} 43 (Spring 1993), 73.
story was “decidedly more apocalyptic than utopian,” exposing “the dark underbelly of conquest and exploitation in the American West.”  

Historian Dan Flores cautions, however, that viewing the West on too grand a scale might distort the true history. He recommends the reverse: select case studies of discrete places and weave history through a study of the land and its people. Build from the particular to the general and let the broader “pattern” emerge.

Undoubtedly a serious mistake historians have made in writing about (let us say) a territory as vast and as topographically, ecologically, and culturally diverse as the American West has been to start with a single interpretive framework like Turner’s or Limerick’s and then to set about forcing the world around us into some facsimile of that model. A more logical and enlightened approach . . . is to go after the reality of the specific, to write sophisticated, deep-time, cross-cultural environmental histories of places—and after a sufficient number of such case studies have been done, then to look for patterns.

This thesis is designed to add another case study to help build the West’s historical map. Set within a thirty-six square mile township in the Waldo Hills of Oregon, this study is framed within the context of competing historical schools of interpretation about humans and the ecological landscape of the American West. This chapter lays out the most prominent competing views within recent environmental history: the declensionists who explain the impact of the advance of Western civilization as a

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19 Robbins, “Laying Siege to Western History,” 191 and 194.
20 Dan Flores, “Place: An Argument for Bioregional History,” Northwest Lands, Northwest Peoples: Readings in Environmental History, Dale D. Goble and Paul W. Hirt, eds. (Seattle: University of Washington Press, 1999), 44. In n. 45 related to this quote, Flores says he singled out Limerick for her influence, not that she believes any one interpretive framework could explain all places in the West over time.
decline from ecological stability to ecological decay,²¹ and the postmodern deconstructionists who maintain that modern concepts of nature, wilderness, and ecosystems are social constructions without basis in actuality and therefore should not serve as the basis for historical analysis.²² Not all environmental historians fit neatly into these two schools of thought, but I will compare the primary protagonists in each to develop an understanding of the debate and why this thesis falls primarily within declensionist thought.

Environmental history developed parallel to the science of ecology as outgrowths of natural history in the late nineteenth to twentieth centuries. Therefore, developments within the field of ecology informed environmental history, and vice versa. Controversies of thought can be found in both ecology and environmental history, especially over whether healthy ecosystems demonstrate stability, or balance, from which they can decline, or, whether nature is always in flux. In the later case, continual change in the landscape, even from human development, is considered natural. Environmental historian Richard White explains the paradox of the ongoing relationship between ecology and environmental history:


One of the ironies of environmental history is that historians have themselves helped erode ecological verities even as they used them to evaluate history. Historians revealed to ecologists how far back human manipulations of the environment went and how extensive they were. It became harder for scientists to think that the communities they were describing and studying were the results of natural processes alone. Ecologists themselves turned to historians to help reconstitute their science to study human social and economic processes as well as biological processes. Historians, who had relied on the scientists to provide their basic guidelines, and scientists, who saw historians helping transform their object of study, met in a sort of mutual bewilderment. Things will certainly progress beyond this – and a new and exciting scholarly hybrid may result – but so far [c. 1990] there has been little progress.23

Determining whether American Indians have been exploiters or preservers of nature is an ongoing issue among anthropologists, ethnologists, and historians and has relevance to environmental history. This chapter explores the various approaches and key figures in this controversy as it applies to this thesis. Less controversial, but relevant, are the various accounts of Oregon’s historic landscape and its transformation over time. This chapter provides a historiographical review of these narratives focusing on the Willamette Valley.

SCHOOLS OF INTERPRETATION IN ENVIRONMENTAL HISTORY

Environmental history emerged as a unique academic field of study in the early 1970s. The field of natural history, as practiced from the seventeenth to nineteenth century, included a form of environmental history along with the developing life sciences. As ecology became a sophisticated science focusing on ecosystem functions, the narrative form of human-nature interactions, environmental history, had to stand alone. Richard White defined the field in 1991 as “the history of the consequences of human actions

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on the environment and the reciprocal consequences of an altered nature for human society.’’

Some historians claim environmental history has yet to be clearly defined. Historian Douglas Weiner, writing in 2005, attempted a definition despite what he termed the field’s ‘intellectual uncertainty, diversity, and even incoherence’ but failed to clearly articulate it. One reason environmental history has defied a consensual definition could be its varied interpretative approaches and the social, economic, and ecological controversies they provoke. These controversies are most apparent within the interpretive approaches of declensionism and postmodern deconstructionism.

Declensionist narratives describe the decline from a healthy state of nature to one negatively impacted and destabilized by exceptionally exploitive human civilizations, especially the expansion of Western civilization in the eighteenth and nineteenth centuries. In his book *What is Environmental History?* J. Donald Hughes more generally defines declensionist narratives as ‘a process by which a reasonably beneficial environmental situation became progressively worse due to human actions.’

Another historian compares the positivistic narrative exemplified by

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25 Douglas R. Weiner, “A Death-defying Attempt to Articulate a Coherent Definition of Environmental History,” *Environmental History* Vol. 10 (July 2005), 404-420. Weiner is noted for his work on Russian history, but he also covers Russian environmental history.
Frederick Jackson Turner as “full of glory and optimism” compared to the declensionist view, which “describes ignominy and ecological failure.”

In America, the declensionist view of Western expansion can be seen as early as 1864 in George Perkins Marsh’s *Man and Nature*. Nineteenth century naturalists and philosophers Henry David Thoreau and John Muir also expressed it. Some examples of twentieth and twenty-first century declensionist narratives are Roderick Nash’s *Wilderness and the American Mind* (1967), Donald Worster’s *Dust Bowl: The Southern Plains in the 1930s* (1979), Carolyn Merchant’s *The Death of Nature* (1980), Sing C. Chew’s *World Ecological Degradation* (2001), and Gilbert LaFreniere’s *The Decline of Nature* (2008).

By 2001, environmental history had progressively become far less declensionist than it was during its formative years, according to environmental historian Richard White. He claims this was due in large part to changes in the field of ecology, which jettisoned the notion of balance and climax ecological communities. White claims “the very ability to specify what is natural and what is cultural or social or technological, largely but not entirely taken for granted [twenty-five or thirty] years ago, is not nearly so clear in the current literature.” White’s statement suggests the influence of postmodern thought on environmental history, which is most evident in William

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Postmodernism has its roots in twentieth century French philosophy and came to be applied, generally, to the critique of modern beliefs in industrial and technological societies. It is specifically critical of the modern worldview that arose during the eighteenth century, which replaced religious beliefs, traditions, and customs with “the notion of the freely acting, freely knowing individual whose experiments can penetrate the secrets of nature and whose work with other individuals can make a new and better world.”³⁰ Postmodern “critics of science and history point to the twentieth century and its pollution, genocide, famine, world wars, and depressions as evidence of the failure of the Enlightenment and its ideals of democracy, science, and reason.”³¹ Such failure opened the door to challenge other modern ideas and their respective terminology believed to have derived from social and political pressures that lack real world foundations.

Historian Alun Munslow claims that historians of the deconstructionist ‘turn’ are conscious that the written historical narrative is but a formal *re-presentation* of historical content.”³² This prompted them to think self-reflectively about how language is used, which led to seeing language as merely representing rather than corresponding to reality: “there is no ultimate knowable historical truth, our

³¹ Ibid.
knowledge of the past is social and perspectival, and written history exists within culturally determined power structures.”

This idea — that there is no certainty of meaning in language-based texts because anything ‘out there’ is always encountered as a social construction — has provoked concern of extreme relativism. Postmodern interpretations of history are determined by where one stands and dissolves source-derived certainties [i.e., reliance on evidence] in historical representation. The deconstructionist historian “maintains that evidence only signposts possible realities and possible interpretations because all contexts are inevitably [simply] texts within texts.”

In environmental history, the validity of terms such as “wilderness” and “nature” were challenged or “deconstructed” by postmodernists who maintain that all such terms are socially constructed, and are therefore “relative since they reflect changing beliefs about nature . . . under the influence of social, economic, and political forces.”

Historian William Cronon was one of the earliest postmodern deconstructionists to question the validity of these concepts. He claims, “There is nothing natural about the concept of wilderness. It is entirely a creation of the culture that holds it dear, a product of the history it seeks to deny.”

Although most environmental historians now follow the deconstructionist approach, Douglas Weiner blurs the lines between the two interpretations. He claims

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33 Ibid.
34 Ibid.
35 Appleby, Hunt, and Jacob, *Telling the Truth about History*, 372-3.
that after “two decades of tortured language and undecipherable jargon, it is fair to say that, like it or not, we are all poststructuralists now. Every speaker, we recognize, is situated—even the deconstructionist.”

One example of an environmental historian attempting to define his approach in this indefinite field is Geoff Cunfer in his 2005 book, *On the Great Plains: Agriculture and Environment*. Claiming to be writing in the spirit of the mid-twentieth century environmental historian James Malin, and decidedly opposed to Donald Worster’s declensionist approach, Cunfer explains that his work is neither positivistic nor declensionist but is premised on the idea that people “are a part of nature, not separate from it in any measurable way. Just like other species, we are embedded in natural systems, we work to manipulate those systems to our advantage, and we encounter natural restraints that we cannot transgress.” Cunfer’s approach clearly smacks of postmodern deconstructionism, which re-imagines the idea of a separate nature or wilderness that can be exploited as simply a cultural construct.

This thesis more closely follows a declensionist approach than that of a deconstructionist. It builds on ecological evidence that demonstrates a decline from ecologically diverse ecosystems under the management of native peoples to technologically based agriculture and simplified monoculture landscapes with only small vestiges of earlier ecosystems remaining. One difference from other declensionist narratives is that this case study describes a landscape where ecological

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37 Weiner, “A Death-defying Attempt to Articulate a Coherent Definition of Environmental History,” 408.
communities benefited from the native peoples’ management; i.e., there was more opportunity for ecological niches under their management regime than might have occurred without human management that favored biodiversity. Furthermore, this thesis claims that the native people were acting within a particular worldview that contrasted sharply with that of the EuroAmericans who displaced them. It was this change in worldview that initiated a profound change in the landscape, thus demonstrating an “interplay of ideational and material elements” in environmental history.  

ECOLOGY AND ENVIRONMENTAL HISTORY

The field of ecology and environmental history are closely allied, providing structural support for arguments and hypotheses in both disciplines. According to Richard White, historians “thought ecology was the rock upon which they could build environmental history; it turned out to be a swamp.”  

Controversial shifts in ecological thought in the late twentieth century rattled the field of environmental history, fueling its own divergence and controversies. One of the first to catch the drift of the new ecology and apply it to historical narrative was William Cronon.

In Changes in the Land: Indian, Colonists, and the Ecology of New England, Cronon compares his own historical account to earlier writers on the transformation of New England from ‘wilderness’ to English-styled garden. There are those who see only progress in this transformation, like Benjamin Rush, who Cronon claims, saw the changing landscape as “a visible confirmation of the state of human society. Both

40 Ibid., 1115.
underwent an evolutionary development from savagery to civilization.”\(^{41}\) On the other side are those, like Henry David Thoreau, who witnessed this change as an unfortunate decline from a more pure, noble state of “man and Nature.”

Thoreau was a naturalist, poet/essayist, and philosopher who sought to know transcendent truths through the experience and observation of nature. He inspired generations of environmentalists and captured the imagination of those who value a state of wilderness untrammeled by human development. Cronon challenges Thoreau’s narrative as the “myth of a fallen humanity in a fallen world.” He questions Thoreau’s lament over the loss of so-called wilderness in the area around Concord, Massachusetts and Walden Pond. Thoreau expressed the poetic desire to “know an entire heaven and an entire earth,” not the particular landscape that had been stripped of its abundant wildlife and massive, old trees.\(^{42}\) “Is it not a maimed and imperfect nature that I am conversant with?” exclaims Thoreau. Cronon responds to him a century and a half later by asking instead, “How did the ‘nature’ of New England change with the coming of the Europeans, and can we reasonably speak of its change in terms of maiming and imperfection?”\(^{43}\) His answer is a qualified no. We may regret the changes brought about by Europeans, but we cannot claim there is, or ever was, a stable state of nature from which it can fall.

\(^{42}\) Ibid., 15.  
As with many environmental historians, Cronon was tying his work to recent revolutions of thought in ecology, mirroring the controversies over stability vs. flux, cooperation/symbiosis vs. competition, and holism vs. reductionism. Cronon distinguished his work from early ecologists such as Frederic Clements (1874-1945) who invoked the metaphor “complex organism” to describe an ecological formation in the final stages of succession. Clements theorized that, like an individual plant, ecological formations undergo predictable growth patterns (succession) to maturity, eventually dying due to perturbations, after which the process of succession resumes until the formation once again reaches a relatively stable climax state, and the process continues. 44 Although Clements’ organismic metaphor was replaced by Arthur Tansley’s “ecosystem” concept in 1935, the concept of ecosystem health and balance remained dominant until late in the twentieth century. 45

Some have interpreted this ecological paradigm as resting on the idea of a permanent, static state of nature, which explains why concerns over changes from that state were described as a decline. When population ecologists replaced the “balance of nature” paradigm with the concept of nature as flux, many environmental historians

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replaced “environmental decline” with “environmental change.”46 Such narratives deconstruct ideas of wilderness and pristine nature and emphasize instead the continual flux of nature. However, the view of nature as a continual flux has not yet gained total consensus in the ecological community.47 Therefore, environmental historians are split in their allegiances to ecological theories that underpin their narratives.

A deconstructionist narrative based on the American continent might therefore build on this basic scenario: Nature in North America has changed through climatic and geologic action over time and it changed at the hand of Paleolithic humans once they arrived on the continent. It continued to change through subsequent indigenous movements as it did when the colonists arrived, along with their immigrant species. The changes were different depending on the culture of the human ‘changers’ but all was done within the bounds of nature acting as it always does, through a process of flux. Humans are part of nature, and, therefore, their actions become another aspect of

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this ever-changing natural world. Therefore, there is no ultimately ‘pure,’ ‘healthy,’ or ‘balanced’ state of nature from which it can decline.

Within such a framework, Cronon explains his task was not only to describe “the ecological changes that took place in New England but to determine what it was about Indians and colonists—in their relations both to nature and to each other—that brought those changes about.” He intended “to locate a nature which is within rather than without history, for only by so doing can we find communities which are inside rather than outside nature.”

Cronon’s approach has its roots in the work of University of Kansas historian James Malin (1916-1973). In 1946, Malin broke new ground when he wrote the ecological history of the Great Plains as an interaction between humans and their environment, each transforming the other. He was an historian trained in ecology and was at ease asking ecological questions, according to R. Swieringa:

Malin studied past human behavior systematically and comprehensively, by going to the field along with the botanist and soil scientist. He sought to understand past human experience as it was actually lived, the style of life and activities of farmers and villagers, their demographic behavior, farming practices, social structures, and community institutions. He considered the

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49 Richard White in his own first environmental history book, *Land Use, Environment and Social Change*, specifically named Malin as the one who “blazed the trail” for studying the “history of man’s relationship with the North American environment” (7). Later historians focusing on a “variant of intellectual and political history” largely ignored Malin’s work. White claimed they may not have been comfortable with the kinds of scientific and regional data available to them. Malin’s most relevant works include *Winter Wheat in the Golden Belt of Kansas* (University of Kansas Press, 1944) and *The Grassland of North America: Prolegomena to Its History* (James Malin, publisher, 1961).
effects of economic, political, social, and environmental forces on human behavior as part of the larger picture.\textsuperscript{51}

Malin’s historical approach and anti-New Deal political beliefs put him in direct conflict with the ecological work of Frederic Clements. Where Clements described the undisturbed prairie grasslands as a complex and relatively stable community of interacting organisms, Malin claimed the prairie was “an open ecological system in which vegetation continually changed . . .”\textsuperscript{52} When Clements claimed that “the plow that broke the plains” caused the dust bowl, Malin denounced him saying “There is no such thing as an undisturbed grassland in the conventional sense . . . ‘Man’s turning over of the sod with the plow is only a more complete process of cultivation of the soil that took place continuously in nature’ from the burrowings of prairie dogs, the cutting hooves of buffalo herds, and even the heaving of the ground during freezing and thawing.”\textsuperscript{53} Malin’s political views rested on the rights of the individual, and he worried that Clements’ ecological views smacked of socialism and would lead to collectivist agendas.

Ecologist Henry Gleason (1882-1975) provided a scientific basis for Malin’s position. Gleason actively opposed Clements’ organismic metaphor claiming instead, “every species of plant is a law unto itself, the distribution of which in space depends upon its individual peculiarities of migration and environmental requirements.”\textsuperscript{54} In

\textsuperscript{51} Robert P. Swieringa, Introduction to Malin’s \textit{History and Ecology}, xv.
\textsuperscript{52} Ibid., xxi. For Clements see Clements, “Plant Succession: An Analysis of the Development of Vegetation.”
\textsuperscript{53} Ibid.
other words, there is no such thing as a vegetative community, only groups of
individualistic plants competing for their own survival. Gleason’s work was not
considered credible by his contemporary peers but was resurrected decades later by
the population ecologists working on the nature-as-flux concept, with individualism
and competition serving as driving forces for this process.

Donald Worster’s declensionist narrative about the Great Plains, *Dust Bowl: The
Southern Plains in the 1930s* (1979), was the antithesis to Malin’s approach and
Gleason’s ecological views. Writing before the ecological paradigms of stability,
climax communities, and steady state were challenged in the 1980s, Worster called
Malin’s work “a sustained attack on [ecology] and its conservation program of the
Dust Bowl days—first, on the grounds that its theories of equilibrium and climax
made the grasslands a too idealized world and the white man a too disruptive
presence; and, more important, on the grounds that its land-use ideas would do away
with freedom of enterprise and technological progress in the region.”55 Worster
claimed that Malin’s ideological beliefs in American capitalism and entrepreneurship
colored his views on the science of ecology. According to Worster, Malin wanted “to
hear science again reinforce the economic doctrines taught by Adam Smith in *The
Wealth of Nations*. Every plant or animal organism greedily pursues its own gain, the

21 (Jan. 1939), 92-110. For more on the Clements-Gleason debate, see Joel Hagen, *An
Entangled Bank* (New Brunswick, NJ: Rutgers University Press, 1992) and Sharon E.
University Press, 2005).

55 Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (NY: Oxford
University Press, 1979), 205.
old thinking had gone, while an ‘unseen hand’ always makes sure there is a harmonious meshing of interests.” Worster was capturing a time when ecologists were challenging as myth the notion that competition was the driving force of life forms: “Ecologists had eventually come to understand and emphasize the cooperative as well as competitive qualities of organisms.”

The ecologists’ emphasis on cooperation and stable, climax communities threatened to find its way into social programs and conservation efforts that could undermine capitalistic free enterprise in America. Ironically, the ecological paradigm changed in subsequent decades and the programs that would have emphasized ecologically sound and diversified land use practices failed to materialize.

In analyzing the effect of postmodern deconstructionists in 1995, Worster asks, “What should we derive from the study of history to inform current land-use decisions? Is environmental history at all useful to the management of land, or is it a mental disease confusing decisions and clouding judgment?” He soundly challenges the objectivity of postmodern deconstructionist narratives that claim there is no ‘nature’ or stability — all is a process of continual change. Using their own principle of historical relativism, Worster claims we might see that the . . . newest ecology, with its emphasis on competition and disturbance, is clearly another manifestation of what Frederic Jameson has called the ‘logic of late capitalism.’ The most recent models of ecology are sure to be superseded, we can assume, just as [Eugene] Odum’s model of the ecosystem was

56 Ibid., 205-206.
superseded. And realizing that fact, we can conclude they are not necessarily more truthful than their predecessors or their successors.\textsuperscript{58}

Worster opened the door to the charge against the postmodern deconstructionists of historical relativism. If new claims to truth can be discounted based on their own relativism, can a claim of health and stability from which ecosystems fall ever be supported? Worster makes a compelling argument to this end.

First, modern knowledge of ecology and evolution demonstrates that living systems rely on the principle of interdependency. According to Worster, “No species, plant or animal, no person in society, has any chance of surviving without the energy or aid of others.”\textsuperscript{59} Competition and individualism have their place, but not the first place and never the only place. He further claims, “All the changes we can find in civilization, it is now clear, are only changes in the patterns of this interdependency, not in the reality or necessity of interdependency itself.”\textsuperscript{60}

Second, the study of history can reveal models of successful adaptation to change, so that relative stability can be maintained. Successful societies generally live by a set of rules or limits that constrain individual freedoms that could jeopardize the well being of the whole.

\textsuperscript{58} Ibid., 77.
\textsuperscript{59} Ibid., 78. See also microbiologist Lynn Margulis’ works on symbiogenesis; e.g., Lynn Margulis and Dorian Sagan, \textit{Dazzle Gradually: Reflections on the Nature of Nature} (White River Junction, VT: Chelsea Green Publishing, 2007).
Third, change is real but variable. “We can no more take any particular kind of change as absolutely normative than we can take any particular state of equilibrium as normative.”\(^{61}\) Some natural changes occur quickly as with wildfire or volcanic eruption; many others occur on a geologic timescale that exceeds human comprehension. Worster claims that environmental conservation is an effort to protect certain natural rates of change within the biological community from harmful changes resulting from our incompatible technology and perpetual growth economy.

Worster is maintaining a dichotomy between nature and human economy/technology, which the deconstructionists have claimed is myth. Their claim is that all human acts are within nature, regardless of the underlying worldview. Thus, all change would ultimately be compatible. Nevertheless, most dramatic changes to the natural world in the last two centuries have been wrought by humans operating largely outside an interdependency worldview. Such change carries strong potential to be incompatible with natural changes in ecological systems. The discussion that follows contrasts historical narratives on the interdependent belief systems and land use behavior of American Indians. Were their actions ecological or did they exploit nature? Were their actions simply limited by a lack of modern agriculture and technology, which the Europeans applied in earnest, or did their beliefs essentially stymie exploitation?

\(^{61}\) Ibid., 81.
THE “ECOLOGICAL INDIAN” DEBATE

The narratives of some nineteenth and early twentieth century writers such as James Fennimore Cooper, Henry David Thoreau, George Perkins Marsh, Charles Eastman, and Ernest Thompson Seton make a sharp distinction between the American Indian relationship to nature and that of European immigrants.62 Their romanticized Indian was noble, harmonious, respectful, reverential, stable, and in tune with the environment. The deconstructionists have keyed off challenges to the community model and climax ecosystems within the ecological discipline to also dissolve the legend of the noble American Indian acting in harmony with the environment. To the deconstructionists, this is a culturally constructed myth with no basis in fact.

Cronon claims the greatest strength of *Changes in the Land* is the detailed description of the material and political forces that helped shape the ecology of New England—under both Indian and colonial management.63 He specifically refrained from dealing with “matters pertaining to religion.” American Indian historian Calvin Martin argues, however, that Cronon failed to develop an understanding of the ecological impacts imposed by humans operating under one worldview as opposed to

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another; i.e., the dichotomous spiritual and ethical belief systems of the two was a significant factor, which is sorely missed in a purely materialistic approach.\textsuperscript{64} For Martin, not all change wrought by humans is equal or ‘natural’. Some change disrupts the healthy functioning of ecological systems; other change can either benefit or have a neutral effect on ecosystems. Humans can choose to act \textit{within} the constraints of nature, as the American Indians apparently did for thousands of years. Or, they can attempt to avoid natural constraints through technology.

Three years before Cronon published his landmark book \textit{Changes in the Land}, historian Richard White wrote a landmark study on the landscape transformation of Island County, Washington. This area was the homeland of the Salish Indian bands before European explorers and foreign diseases arrived in the eighteenth century and white settlement rapidly escalated in the mid-nineteenth century. White bases his island study “on the premise that different types of land use have created different landscapes.”\textsuperscript{65} He briefly contrasts the underlying worldviews that may have guided land use but his extensive research is clearly focused on changes in plant and animal species and how the changing human communities used and managed them. White’s narrative is not strongly declensionist nor deconstructionist. Rather, it describes a gradual change in landscape as a response to changing societies and technologies as a continual adaptation to new conditions,  


which may have been a harbinger for the more deconstructionist approach he would take in his later work.66

White acknowledges the Salish believed in a “vast array of spirits associated with specific animals and natural phenomena” inhabiting the land alongside humans, plants, and animals. He claims this “added dimension gave the land an ambience and meaning it largely lacked for whites.”67 He argues that “since Indian land use did not eliminate species or entire habitats, the Salish themselves may not have seen any contradiction (nor, inherently, does there seem to be one) between their metaphysical and religious views and their economic uses of the natural world.”68 He further contrasts the American view of land as revolving “chiefly, but not solely, around judgments of its economic usefulness.”69 His analysis shows that for farmers, native species were often unwanted competitors. For foresters, they were a resource.

White challenged the claims of early anthropologists that the Salish lived off the “spontaneous product of nature” until they were displaced by Euroamerican settlers. Instead, he describes their acute knowledge of various plants and their use of fire to manage for the most beneficial ones leading to different ecological communities than would have otherwise occurred. White claims the Euroamerican settlers thought the condition of the land they settled was naturally generated. The

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68 Ibid., 157.
69 Ibid.
journals of early Willamette Valley explorers and settlers, however, demonstrate they clearly understood that Indian burning practices maintained the prairie and oak savanna landscapes.

Although historians largely agree that the landscape encountered by European explorers and later settled was not in a pure state of nature, or Garden of Eden, in which the native people simply gathered its fruits, there is still wide disagreement on whether the Indians’ actions could rightly be labeled “ecological.” There are two primary protagonists who most clearly exemplify this “ecological Indian” debate: anthropologist Shepard Krech III and American Indian historian Calvin Luther Martin.

In *The Ecological Indian*, Krech aims to reveal and destroy the myth that the American Indian lived in harmony with the natural world. They, as all humans, were “dynamic forces whose impact, subtle or not, cannot be assumed.”70 He hinges his argument, in part, on the repositioning of ecological thought when research studies claimed, “Biological communities do not automatically undergo predictable succession toward some steady-state climax community.”71 Krech claims that, if ecological balance and relatively stable climax ecosystem communities are myth, so must be the notion of indigenous people living in harmony with such systems. Krech questions the Indians’ involvement in wild game overkills and beaver trapping to near extinction. He decries the views of

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71 Ibid.
environmentalists and tribal members that “the Indian lived with the land” but the white man destroyed it. Krech’s narrative blurs the line between the two distinct cultures and their impacts on the environment. As one reviewer described Krech’s conclusions, “despite cultural nuances, in the ways we interact with nature we are all much the same.”

Krech expounds on the American Indians’ vast store of knowledge about their natural environment handed down through many generations. He gives little attention, however, to their worldviews or religious practices cautioning that one should not generalize the various independent tribal cultures across America. Nonetheless, his thesis is a generalization, though many of his arguments are hinged on exceptional cases. For instance, fires set in the late eighteenth and nineteenth centuries by tribes already decimated by disease and removal from their homelands, and which became a conflagration, are used as “evidence that Indians lit fires that then were allowed to burn destructively and without regard to ecological consequences . . .” This conclusion contrasts with the findings of others who concluded Indian burning actually enhanced ecological conditions.

The views of American Indian historian Calvin Martin differ sharply from those of Shepard Krech. Martin wrote an historical account of the northeastern

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74 Krech, The Ecological Indian, 120.
75 Boyd and others in Chapter Three.
beaver trade and the Algonkian Micmac in the seventeenth to eighteenth century, *Keepers of the Game* (1978). 76 Martin’s book won acclaim but his thesis sparked controversy among anthropologists, including Krech. Martin argues that the Indians trapped beaver almost to extinction, not because they were interested in receiving the Europeans’ material goods, but because they had become “despiritualized” after being decimated by disease.

Martin contended the Micmac traditionally saw beaver as endowed with “abounding genius,” with the capability of forming “a separate nation.” Beaver were “conscious fellow-members of the same ecosystem who “literally allowed [themselves] to be killed for food and clothing.” 77 Hence, there were rules for proper hunting and rituals for the disposal of their remains. If the Micmac’s hunting taboos were broken, they believed beaver would retaliate by bringing sickness to the humans. 78 Martin hypothesized that the great loss of people to disease, including elders and shamans, led the Micmac to retaliate against the culprit beaver by hunting as many as possible, thereby hoping to end their power to bring on devastating disease.

Shepard Krech sharply disagreed with Martin’s thesis — so much so that he edited a book, which was based on a conference focused on critiquing Martin’s

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77 Martin, *Keepers of the Game*, 35.

78 Likely related to disease factors such as tularemia, which can spread through waterborne transmission from beavers to humans. See Martin, *Keepers of the Game*, 130-144.
book. In *Indians, Animals, and the Fur Trade: A Critique of Keepers of the Game*, the authors—all, according to Krech, “anthropologists and ethnohistorians”—agree in their criticism of Martin.79 One specific disagreement was with Martin’s spiritual emphasis and his attempt to write history through the beliefs of the Indians. Krech compared this to his and the other critics’ “endorsement of a materialist versus an idealist explanation in an admittedly complex system of causation of Indian participation in the [fur] trade.” The critics further argue that a materialist explanation “supports data in historical records and is sufficient to account for Indian participation in the trade.”80

On using fire as a land management tool, Martin acknowledged “there were times when waste and destruction occurred, but the point is that these were aberrations—deviations from the norm. On the whole, the North American Indian earns high marks for his cautious use of plant resources.”81 Martin’s assessment is consistent with the evidence of complex vegetational communities managed by the Kalapuya in the Willamette Valley. However, the evidence suggests the Kalapuyans’ practices were more than just cautious; they promoted a higher diversity of plants and habitat types. The result was that more ecological

opportunity occurred due to the Indian practices, not despite them, as Krech’s thesis suggests.

Martin argues for considering two basic issues involved in writing such history: “the ideology of Indian land-use and the practical results of that ideology.” This is not to deny the distinct cultural differences of various North American Indian tribes, but to acknowledge that they shared a fundamental belief: a “genuine respect for the welfare of other life-forms.”

Nature, for virtually all North American Indians, was sensate, animate, and capable of aggressive behavior toward mankind. When Indians referred to other animal species as “people”—just a different sort of person from man—they were not being quaint. Nature was a community of such “people”—“people” for whom man had a great deal of genuine regard and with whom he had a contractual relationship to protect one another’s interests and fulfill mutual needs. Man and Nature, in short, were joined by compact—not by ethical ties—a compact predicated on mutual esteem. This was the essence of the traditional Indian-land relationship.

Martin realized the distinct difference between the Indian worldview and that of the Euroamerican, whose ethics have been informed by a non-pagan Judeo-Christian ethos and the belief in individualistic rights to build wealth through capitalism. He claimed that the American point of view was simply not compatible with that of the Indian. At best, “we might witness a co-functioning of two ideologies of land-use—that is, we might if they were mutually compatible, which they are not.” In other words, the two worldviews were mutually exclusive: one did not and could not evolve into the other. In this sense, the Indian could not simply adopt Western tools and

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82 Ibid. Emphasis added.
83 Ibid., 187.
84 Martin, *Keepers of the Game*, 188 (footnote ‘e’.)
practices for managing land. This is exemplified in Thomas Jefferson’s dream for the Indians that was never realized, although Indian boarding schools made forceful attempts to reeducate and ‘civilize’ Indian youth.85

Martin also cautioned environmentalists who attempted to adopt the American Indian as symbol and ‘guru’ for their cause, as Krech would also caution twenty-two years later in his own book—but for substantially different reasons. Martin described in detail the historical roots of the idea of “the ecological Indian” and its promotion in the 1960s and 70s by such notable figures as U.S. Secretary of the Interior Stewart Udall, Native American historian Wilbur R. Jacobs, and American Indians N. Scott Momaday and Vine Deloria, Jr. He also discussed the detractors, including Clifford Presnall of the U.S. Fish and Wildlife Service, ethnologist Bernard J. James, and historian W. H. Hutchinson who essentially claimed the label represents a sentimental ideology with little to no basis in fact.86

Martin criticized the label, because the ecological attitude was a result of the native peoples’ distinctive belief system. The Indian way was antithetical to American beliefs in individualism, competition, and a separate, objectified environment. Environmentalists from the Western tradition could no more adopt the Indian’s


cosmology than the Indian could adopt the Western cosmology, without one actually becoming the other. The native peoples’ worldview that nature represented a community of animate and inanimate relations behaving reciprocally helped to sustain the ecological systems before colonization. Martin argues that the Western view would need to be rejected before the Indian view could even begin to be adopted. Thus, the idea of the Indian as ecological guru for Westerners did not work.

Both Shepard Krech and Richard White also viewed the label of “ecological Indian” as a misnomer. Krech calls it “ultimately dehumanizing,” because it denies “both variation within human groups and commonalities between them.”87 He acknowledges that environmental historians William Cronon and Richard White influenced his work on this topic. White claims the idea that Indians left no trace demeans them. “It makes them seem simply like an animal species, and thus deprives them of culture.”88 An edited book was subsequently published in response to Krech: Native Americans and the Environment: Perspectives on the Ecological Indian (2007). The book is a collection of essays that “continue and complicate the conversation” Krech started, ranging from traditional ecological knowledge, native hunting practices and “myths of the ecological white man.”89

87 Krech, The Ecological Indian, 26.
HISTORICAL APPROACHES TO LAND TRANSFORMATION IN OREGON

William Cronon applauds works of history that look beyond the human dimension. He hoped that some day no historian would write without “reference to natural systems [nor] acknowledgement of the other creatures with whom we share this planet.”90 Historian William Robbins accomplishes this in his environmental history of Oregon, focusing on the landscape and the influence of changing human cultures.91 In Landscapes of Promise: The Oregon Story 1800-1940 Robbins writes of “the interface between humans and the natural world” and “the history that humans themselves have inscribed on the landscape” especially over the two centuries since Europeans entered the northwest.92 Robbins reflects on the writings of early explorers, trappers, and settlers to provide the context of a landscape still largely under the influence of native cultures. He paints a picture across the broad sweep of Oregon from the coast to the valley and beyond to the eastern high plateau along with the Columbia Basin and Oregon’s southwest.

Robbins argues “that culture has been a powerful force in shaping the place we call Oregon; it also suggests that the ever expanding cultural influences of the last two centuries have vastly accelerated the pace and scope of change with the passage of time.” Robbins makes it clear that the ecologically deleterious change wrought by

90 Cronon, Changes in the Land, 173.
91 William Robbins’ contributions include several articles and books relevant to this study: Landscapes of Promise: The Oregon Story 1800 – 1940, (Seattle, WA: University of Washington Press, 1997); Landscapes of Conflict: The Oregon Story, 1940-2000 (Seattle, WA: University of Washington Press, 2004); and Colony and Empire: The Capitalist Transformation of the American West (Lawrence, KA: University Press of Kansas, 1994).
92 Robbins, Landscapes of Promise, 15-16.
Western expansion was driven by the values of a capitalistic system that imposed a “culturally preconceived ordering on a common demographic and political unit.” Through this process, the land was transformed from locally based ecosystems into “human-centered, utilitarian landscapes” providing goods to a global marketplace.

Robbins’ work is especially relevant to the focus of this study on the effect of the rationalistic and reductionist rectangular survey promoted by the 1850 Donation Land Claim Act and the private property values promoted by John Locke and Thomas Jefferson.93

Geographer Jerry C. Towle’s 1974 dissertation, “Woodland in the Willamette Valley: An Historical Geography,” specifically examines changes in the vegetative structure of the Willamette Valley landscape. He examines the transformation of the landscape from its geologic past to the earliest documented human occupation, focusing especially on the more recent Kalapuyan occupation, before considering the impacts of European settlement to the twentieth century. Towle took a geographical approach in reconstructing the landscape under Kalapuya management, as gleaned from early journals and surveyor notes. However, he concentrated most on Euroamerican settlement and subsequent agricultural development. The concern of his study was “landscape change as a result of specific, man-induced processes, deliberate or accidental.”94

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93 Ibid., 16.
Towle’s specific purpose was to “examine the changing nature and distribution of woodland in the southern Willamette Valley, and to attempt to relate these changes to a succession of settlement and land use patterns from the time of Indian occupance [sic] to the [1970s].” He was interested in the cultural ecology of the southern valley as influenced by “political, economic, or social innovations” and their “ultimate reverberation” on the landscape as measured by changes in woodlands. Towle did not look into the underlying worldviews as a shaping force, but focused rather on the dynamic social and material influences, including to a limited degree the influence of the 1850 Donation Land Claim Act.

One of the first to undertake a detailed study of the Willamette Valley’s historic vegetation based on analysis of the 1850 Donation Land Claim Act cadastral survey notes was botanist James R. Habeck. Habeck’s 1961 article in *Northwest Science* examined the historical vegetation of one cross-section—Township 8 S, just one township south of the area being considered in this thesis. Using the notes and other primary and secondary sources, Habeck concluded that the “Willamette Valley, at the time of settlement, was covered largely with oak openings and prairie” which is “in contrast to earlier suggestions that the valley supported a predominantly coniferous forest,” as earlier studies had claimed. He also concluded that “very little of the original vegetation” remained at the time of his writing in 1961.

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Robert R. Bunting’s *Landscaping the Pacific Northwest: A Cultural and Ecological Mapping of the Douglas-fir Region, 1778-1900* comes close to asking many of the same questions as this thesis. Bunting takes a bioregional approach to the “physical and cultural ecology” of the Pacific Northwest where he says “ecological and cultural systems interact to shape one another.” He claims his narrative demonstrates “how a place is physically and culturally mapped” and the result is largely declensionist. Bunting compares the worldviews and ecological consequences of Pacific Northwest tribes with that of the Europeans who, Bunting claims, so changed the Northwest’s “web of life” that it could “best be termed an invasion.” Bunting’s work covers far more territory than this effort, and, as with Towle, he focuses more on changes within forest/woodlands than the whole mosaic of land within a smaller area. Nonetheless, his research and analysis are noteworthy and relevant to this study.

Jeff Lalande’s environmental history of the Little Applegate River Watershed (1995) in southwestern Oregon emphasizes the changes in land resulting from changing geologic and climatic conditions as well as shifting human cultures over time. As an archaeologist and historian, Lalande includes an interesting discussion on the cultural periods of human occupation from the Early Archaic (9,000 to 4,000 years ago) (McGraw-Hill Book Co., 1938), and C.P. Barnes, “Environment of Natural Grassland” in *Grass: Yearbook of Agriculture* Vol. 66 (1948), 45-49.


Ibid., 5, 7-8, 76.
B.P.) to the Late Archaic (ca. 1,500 to 200 years B.P.) before describing the change resulting from European contact and exploitation, notably mining. He provides a thorough account of the native peoples’ use of fire and tools to manage their resources, citing archaeological studies as evidence for his historical analysis.\textsuperscript{100}

Lalande provides a compelling argument, based on written records and dendrochronological records from tree ring studies, suggesting that miners’ and settlers’ use of fire was more likely responsible for large, out-of-control fires than the native peoples’ historic burning. He claims, “Contrary to what some sources have concluded about the Western U.S. in general . . . at least in the eastern Siskiyous the ‘disintegration of native cultures’ during the nineteenth century did not substantially reduce the amount of ecosystem fire. If anything, the extent of human-caused fire probably grew in the region between 1860 and 1920.” Lalande goes on to describe accounts of such fires, which were often set in the warmer months of the year and were likely “much more sporadic and random than was the case with native fires—which were set by people who very closely and continuously observed the vigor of vegetation at particular gathering sites.”\textsuperscript{101}

Although most of Lalande’s study deals with material changes rather than different cultural practices, he includes a section on varying attitudes toward human-set fires. He describes the native culture’s view as both an “enjoyable social activity” and “a conscious ‘duty’ of good land stewardship” as opposed to settlers’ mixed views.

\textsuperscript{100} Jeff Lalande, \textit{An Environmental History of the Little Applegate River Watershed}, (Medford, OR: USDA Forest Service Rogue River National Forest, 1995).
\textsuperscript{101} Ibid., 64.
varying from “likely to make . . . better grazing ground for deer and other stock” to “useless destruction of property,” and that the smoke generated was “aggravating to summer diseases.”


Boyd claims that the “Native Americans used fire purposefully and in patterns that reflected a traditional ecological knowledge that was both broad and deep.” He suggests, “The judicious use of fire by non-agriculturalists, in fact, may even have promoted ecosystem diversity.” He speculates on the potential use of fire today to bring back some of the ecological health lost as Euroamerican systems neglected the burning regime, “imported, and superimposed” their own plant and animal domesticates. Now, “the land is broken, fertilizer is applied, forests are treated as crops” and thousands of alien species have been introduced “upsetting indigenous ecosystems.” Boyd does not consider the underlying role of worldviews, but clearly

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102 Ibid., 68-69.
makes a distinction that the indigenous practices, including their cultural beliefs, maintained a far healthier ecological environment than the Western culture that replaced it.\(^{104}\)

Historian Peter Boag wrote on the transformation of the Callapooia watershed in the mid-Willamette Valley from Kalapuya occupation to Euroamerican settlement, through the early twentieth century. He contrasts the Kalapuya management of the “valley of the long grasses” with that of the earliest trappers and settlers, and he continues through time to consider the impact of changing attitudes and activities in the late nineteenth and early twentieth century. Boag’s work greatly contributes to historical studies of the Willamette Valley landscape and applies a bioregional approach that he says is inspired, in part, by the work of Cronon and White. He claims his “community approach” differs from “the superb environmental studies” of Richard White and William Cronon, in that they concentrated on “social, economic, and ecological issues” but “passed over the cultural-intellectual component of the relationship between the human and the land.”\(^{105}\)

Boag is the first in this Oregon historiography who appears to apply a deconstructionist’s approach to environmental history. Boag rejects the traditional interpretation put forward by historian Roderick Nash, which claims “settlers saw the American wilderness as a threat to their survival and that its strange and fearful

\(^{104}\) Ibid., 292-294.

inhabitants (both real and imaginary) challenged their moral integrity.”

Certainly, the settlers’ interest in ridding the land of wolves and grizzlies suggests they not only wanted to clear the land of livestock predators, but also feared the dangerous aspects of the wild—and intended to tame it. They were also likely to fear the native inhabitants and were relieved to have them removed from settlement areas. What the journals of early trappers and settlers’ suggest is that there was no one dominant view of the land or the Indians. As Boag writes, and the evidence of this study corroborates, the American relationship to the land was “multifaceted, often contradictory, and certainly not black-and-white.”

However, the basic tenets of individualism, industriousness, and private property values and rights contained within the new American worldview prevailed over all others.

Boag’s alliance with the deconstructionists creates some confusing conclusions. He asserts that, “as the Kalapuya vanished, so, too, did the environment they and nature had created. Nature, however, remained a constant, and Euro-Americans working within its possibilities and responding to growing and distant markets created a new, relatively unstable environment in the valley.”

What does Boag mean by unstable? To be unstable, it must first have been relatively stable; it must have had characteristics of a healthy system. What could have been relatively stable other than the whole of nature itself, of which the native people were a part? It was the wholeness that destabilized when the Euroamericans imposed their own beliefs, reshaping the

107 Ibid., xvii.
108 Ibid., 141.
land in their own image. This culture set out to divide land into squares and provide it free to white settlers who were willing to make the long trek west and ‘improve’ it. They carried their worldview west with them and never intended to work within the whole indigenous ecosystem they encountered.

This study contributes to the historical evidence that there is a healthy state of nature, which has suffered decline over the last two centuries and that landscapes are shaped, in part, by the underlying worldviews of its human inhabitants. Chapter Two describes the history of the rectangular survey developed by Thomas Jefferson and argues that this unique rationalized system reflects the emerging American worldview. Chapter Three develops an ecological reconstruction of the Waldo Hills based in part on information gleaned from the 1851 survey in the Oregon Territory. The landscape in transition from Indians to Euroamerican reflects an impending cultural shift. The American worldview brought to the Waldo Hills in the nineteenth century was strikingly different than that of the Kalapuya. The transformed pattern can be viewed from the air over the western lands of the U.S. as squared-off forest clear-cut on steep mountain slopes, straight roads striking across rolling topography, and rectangular agricultural fields stretching for miles. The “Americanized landscape” took shape — replacing not a wilderness or a pristine or primitive landscape, but the “native landscape” shaped in part by the native people who actively maintained their homeland.
CHAPTER TWO: THOMAS JEFFERSON’S SQUARING OF THE LAND

The American invention of the square-based public lands survey symbolized the ideal state envisioned by the founders of the new republic. The system would establish order across a complex, resource-rich landscape. It would parcel out land to free men who would help build a democracy in which they not only participate but individually profit, thereby benefiting the whole. Once surveyors had stretched the ‘fabric’ of the grid from the Ohio territory to the Oregon Territory, the subjective and dynamic natural world inhabited by native peoples was subdued and transformed into an objectified, ordered, and simplified world. Viewed from the air today, this landscape boldly reflects the original surveys undertaken in the eighteenth and nineteenth centuries. Foreigners from outside the United States and Canada view the unnatural property lines and roads stretching north-south and east-west and wonder at their exotic character.\(^{109}\) Though commonly used in town plans, the grid’s application across a vast open and undulating territory was uniquely American. The rural lands of European countries, on the other hand, reflect their own landholding history and style of survey but commonly reflect the natural contours of their countryside. It was Thomas Jefferson’s vision that formulated the American system of order — a vision that reflected his interests in Enlightenment values, rationalistic science, and classical Greek and Roman thought.

According to historian Hildergard Binder Johnson, “sixty-nine percent of the land in forty-eight states is contiguously covered by the rectangular survey” making it the “most extensive uninterrupted cadastral system in the world.”\textsuperscript{110} The Land Ordinance of 1785 first established the Public Land Survey System, or rectangular survey, in order to accurately and expeditiously map land, offer it for sale to help pay off Revolutionary War debts, and encourage settlement in previously unmapped territories.\textsuperscript{111} The system was designed to carve huge tracts of land into regular squares, a plan previously seen in the orderly layout of towns in ancient Greece, China, and some New England colonies. Though Jefferson originally proposed a system based on hundreds, the one that prevailed was based on six-by-six mile townships divided into thirty-six squares, each containing one square mile or 640 acres.\textsuperscript{112}

Frederick Jackson Turner extolled the Ordinance of 1785 “for under its provision almost all of the Middle West has been divided by the government surveyor into rectangles of sections and townships by whose lines the settler has been able easily and certainly to locate his farm and the forester his forty.”\textsuperscript{113} But squares and

\textsuperscript{110} Hildegard Binder Johnson, \textit{Order Upon the Land} (NY: Oxford University Press, 1976), Preface (no page number), 30.  
\textsuperscript{113} Quoted in Johnson, \textit{Order Upon the Land}, Preface.
rectangles did not necessarily work for agriculture, or forestry, and certainly not for meandering streams, watersheds, roads and trails, or ecosystem boundaries that commonly follow natural contours of the land. The system was imagined and designed by “men of the eighteenth century, the century of rationalism and enlightenment.” It created a relatively simple and efficient method of survey and sale but disregarded characteristics of the land itself and the naturally converging longitudinal lines that are not set at right angles to latitudinal lines due to the Earth’s spherical shape.

Nevertheless, under this and subsequent land ordinances, the distinctive grid became stamped across the continent, a visual manifestation of the emerging American worldview. Scholars have questioned why Jefferson chose the square for the public lands survey but have yet to propose a definitive reason. This chapter synthesizes Jefferson’s relevant scientific, architectural, and philosophical interests to argue that his purpose was rooted as much in the symbolic meaning of the square as in its relative efficiency for surveyors. It was a reflection of Thomas Jefferson’s complex conglomeration of interests: a philosophical belief in egalitarianism among white men,

114 Ibid., 20.
115 Canada also adopted a rectangular survey system under the Dominion Land Surveys Act of 1869. It was based on the U.S. system but with changes to provide road allowances and consistency with converging longitudinal lines. One can see similarities in the grid pattern from an aerial perspective, but Canada is marked more by its long rectangular road system (in some areas square) than the series of abutting rectangular property lines seen across the U.S. See J.S. Dennis, A Short History of the Surveys Performed Under the Dominion Lands System 1869 to 1889 (Ottawa: s.n., 1892) and available online at the University of Alberta libraries: http://peel.library.ualberta.ca.
116 See John R. Stilgoe, Common Landscape of America, 1580 to 1845 (New Haven, CT: Yale University Press, 1982), 103; and, Johnson, Order Upon the Land, 30.
interest in classical Greek and Roman symbolism, and the application of scientific and rationalistic methods. He may also have been influenced by the square’s symbolic significance to Freemasons. An examination of Jefferson’s decision to employ the square and the implications of that decision are the focus of this chapter.

THOMAS JEFFERSON’S VISION

Thomas Jefferson’s contribution to creating a governmental system based on Enlightenment values and scientific rationalism did not end in the political sphere. It extended to designing the uniquely American landscape, including the acquisition of vast lands to the west and establishing the pattern of settlement that rapidly spread across it. The pattern he created and successfully promoted was in the shape of perfect squares—a Cartesian grid to be drawn across uncharted territories, radiating from the intersection of a north-south meridian and east-west baseline. Jefferson’s interest in the square symbolized his political ideology derived from classicism and the influence of Masonic belief that perfect squares and right angles signified virtue. For Jefferson, the squared-off lands created the potential for individuals to own a share of land outright and reap the benefits of their own cultivation and improvements. The plan fit within his desire to revolutionize and systematize standards of measurement so as to encourage commerce among free and equitable men acting on their own volition to enact the democratic principles of the young nation.117

117 Jefferson’s interest in classicism and symbolic expression of virtue is most readily apparent in his architectural design interests, his plan for the District of Columbia, and serving on the committee to develop the Great Seal of the United States. See Silvio A. Bedini, Thomas Jefferson: Statesman of Science (NY: Macmillan Publishing Company, 1990), 212-214; James L. Golden and Alan L. Golden, Thomas Jefferson
A rectangular survey system was a simple, efficient method for surveyors with basic mathematical skills and the proper technical equipment to draw lines oriented to true north, allowing for expedient, efficient, and effective marking and mapping of new territories. Rectangles could be easily divided and apportioned equitably. Settlers themselves could pace out an acreage relative to the sun for cardinal direction and come remarkably close to paralleling the surveyors’ section lines. It was Jefferson’s reliance on perfect squares, as opposed to unequal sided rectangles, that made his survey system especially unique.

Jefferson saw the rectangular system as more fully expressing the rational mind of the Enlightenment believing that land divided into squares provided “a framework around which democracy could grow.”¹¹⁸ No doubt the method was more precise and efficient, but it changed the human relationship to the land from focusing on the natural or cultural features across the landscape to a pre-determined mathematical plan laid upon the land, unaccountable to its natural characteristics. The system demonstrated “no regard for features of the natural landscape” nor for settlers’ farming

¹¹⁸ From Linklater, *Measuring America*, 76.
practices or needs to access water, woodlots, productive soil, and transportation routes.\textsuperscript{119}

There were other land division options that would have better matched landscape features and existing farming practices, such as metes and bounds or the French system of long lots.\textsuperscript{120} But these were too cumbersome and difficult for the rapid settlement envisioned by Jefferson to establish American sovereignty on land stretching to the Pacific.\textsuperscript{121} The new system could also reflect Jefferson’s interest in rejecting European models as the founding fathers sought to establish a new order of democracy based on “perfection and stability” exemplified in pure classical forms, such as squares.\textsuperscript{122}

The original British colonies relied on the \textit{metes and bounds} system of surveying, an ancient method “which identified the boundary of an estate by the points where it met [i.e., “mete”] other boundaries or visible objects.”\textsuperscript{123} Though far more

\begin{itemize}
\item \textsuperscript{120} Information on various survey systems employed on the North American continent can be found in McIlwraith and Muller, \textit{North America: The Historical Geography of a Changing Continent}, 150-154 and Johnson, \textit{Order Upon the Land}, 3-49.
\item \textsuperscript{121} Legal scholar Robert J. Miller makes the case that Thomas Jefferson sought to capture land to the Pacific through the Doctrine of Discovery. The internationally recognized Doctrine required proof of discovery and settlement to claim lands from the mouth of a river to its entire watershed; e.g., the Columbia River. “Manifest Destiny grew naturally out of the principles and legal elements of the Doctrine of Discovery, Thomas Jefferson’s ambitions, and the path-breaking work of the Lewis and Clark expedition.” From Miller, \textit{Native America Discovered and Conquered: Thomas Jefferson, Lewis and Clark, and Manifest Destiny} (Lincoln, NB: University of Nebraska Press, 2008), 115.
\item \textsuperscript{122} Meyer, \textit{Myths in Stone}, 49.
\item \textsuperscript{123} Linklater, \textit{Measuring America}, 8.
\end{itemize}
complicated to survey, this system provided greater flexibility for designing a farm based on terrain, soils, and water features. The French long lot system (also referred to as the rang system) was used primarily in Canada and Louisiana, though it can also be seen in the earliest settlement areas of French trappers in the Oregon Territory and elsewhere.124 In this system, parcels of land could be as much as ten times longer than they were wide and were laid out in successive parallel lots backing up to a river or road. The objective of the long lot system was to provide ready access to water transportation and river resources as well as wood and cultivatable land.125 Any long lot system during Jefferson’s time would have been more efficient for plowing, largely done with teams of oxen, because it would minimize loss of cropland and the physical labor required to turn the teams. The length a team of oxen could plow without resting became the common measure of length: the furlong (or furrow length).

ON NEED TO STANDARDIZE WEIGHTS AND MEASURES

Thomas Jefferson was keenly interested in finding a scientific basis for measurement that would remove the control of weights and measures from authoritarianism and make it more accessible to anyone with a basic understanding of arithmetic.126 He was highly influenced in this effort during his trips to Europe while serving as envoy to

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124 For instance, the area around St. Paul, Oregon in the Willamette Valley shows the characteristic long lot system as developed by early French trappers in contrast to the square-based lots established after the rectangular survey.
125 See Johnson, Order Upon the Land, 21-28.
126 From Linklater, Measuring America. Linklater has done some of the most extensive research and writing on development of the American surveys. Ken Alder’s The Measure of All Things, NY: The Free Press, 2002, also covers the international effort involving Jefferson and France’s work to devise a scientifically-based standard measure based on the size of the Earth.
France (1785-1790). Along with Enlightenment thinkers in France and England, Jefferson hoped that “the French, the British, and the Americans—‘the world’s three most enlightened and active nations’” would all employ the same measures.\textsuperscript{127} To this end, during his time in France, the marquis de Condorcet (permanent secretary to the Paris Académie des Sciences) invited Jefferson, along with England’s Sir John Riggs Miller (member of the British Parliament), to participate in a joint experiment to develop a standard measure of length.

Jefferson would later repeat the ideas of Condorcet in America: “the uniformity of weights and measure cannot displease anyone but those lawyers who fear a diminution in the number of trials, and those merchants who fear anything that renders the operations of commerce easy and simple.”\textsuperscript{128} Their work eventually resulted in a plan for a standard length of measure: an iron rod “the length of a second’s pendulum” vibrating seconds at 45° latitude, which runs through Paris and is half the distance from the equator to the pole. Such a measure would be based on a fraction of the “motion of the earth round its axis, though not absolutely uniform and invariable, [it] may be considered as such for every human purpose.”\textsuperscript{129} The fraction would be one second of the 86,400 seconds in a day. Though Jefferson originally proposed using a

\textsuperscript{127} The marquis de Condorcet quoted in Alder, \textit{Measure of All Things}, 88.
\textsuperscript{128} Condorcet, quoted in Linklater, \textit{Measuring America}, 94.
parallel running through the middle of America, at the 38th parallel, he conceded to the 45th “with the hope that it will become a line of union with the rest of the world.”

Upon his return to the United States in 1790, Jefferson was appointed Secretary of State. In this capacity, the House of Representatives called on him to propose a system of standards. The result was his “Plan for Establishing Uniformity in the Coinage, Weights, and Measures of the United States,” which was communicated to the House of Representatives on July 13, 1790. Jefferson recommended several adjustments for creating uniform standards with a scientific basis consistent with democratic principles that citizens should be provided the means to manage their own commercial activity. His proposed new standards of weights and measurement were based on a decimal or metric system. This would be consistent with a decision by the House of Representatives in 1786 to create a uniform, decimal-based system of coinage. He argued for the extension of the decimal system to other forms of measurement in order to simplify computation for the general masses, because existing methods created many “complicated and difficult ratios.” Jefferson’s argument was consistent with his belief that men should be free to exercise their own authority. Most notably, he proposed a square container (i.e., a cube) as the standard for volume, recognizing that “cylindrical measures have the advantage of superior strength,” but the “square ones

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130 Alder, *Measure of All Things*, 89.
have the greater advantage of enabling every one who has a rule in his pocket, to verify their contents by measuring them.”¹³²

His proposal for a standard measure for land based on a decimal system was similarly simplified. He proposed that the “rood of land, being 100 feet square, (and nearly a quarter of the present acres)” be the unit of land measure, which would then be divided into tenths and hundredths. Multiples of this would also be in tens, “which may be called double acres, and hundreds, which will be equal to a square furlong each.”¹³³ He would also revise the commonly used Gunter’s survey chain of 66 feet (made up of 100 links of .66 foot each) to 100 feet length containing one hundred links of one foot each.

Jefferson’s scientifically based decimal systems of measurement were provided to the House as an option, which they could choose to enact in the near term or delay until such time as “the public mind may be supposed to have become familiarized to it.”¹³⁴ However, while Jefferson was advocating for the new decimal system in the United States, setbacks to an international standard were emerging. Despite the outcome of negotiations between representatives of France, England, and the United States, the Paris Académie’s Commission of Weights and Measures recommended dropping the pendulum standard in favor of “a meter based on one ten-millionth of the distance from the North Pole to the equator as established by a survey of the meridian

¹³² Ibid., 403.
¹³³ Ibid., 415.
¹³⁴ Ibid., 410.
that ran from Dunkerque to Barcelona.”\textsuperscript{135} Upon hearing this decision, both England and the United States rejected the French system as it relied on an exacting, expensive, and time consuming survey with no physical standard of reference for other countries. Jefferson himself lamented that the “element of measure adopted by the National Assembly [of France] excludes \textit{ipso facto}, every nation on earth from a communion of measurement with them.”\textsuperscript{136} This and other setbacks to adoption of a purely metric system in America, along with rapid population growth and settlement already based on English systems of measurement, resulted in the traditional measures of the foot and the pound to remain the U.S. standard (except for scientific uses).

Jefferson’s grid system would therefore be measured, not by meters, but by Gunter’s chain. The chain is a measurement of length based on the furlong. Its use began under the work of mathematician and inventor Edmund Gunter (1581-1626) in seventeenth century England. Gunter was educated at Oxford University in divinity. His talent in mathematics and interest in the invention of useful instruments set him largely outside the traditional academic vocations of Oxford graduates during his time. He invented an early slide rule, “Gunter’s scale,” and is credited with inventing the words \textit{cosine} and \textit{tangent} while assisting his colleague at Oxford, Henry Briggs, in improving logarithmic tables.\textsuperscript{137} The tables were a boon to surveyors using triangulation to determine the distance between two objects without having to walk

\textsuperscript{135} Ibid.
\textsuperscript{136} Ibid., 126.
between them. Although the Dutch mathematician Johannes Frisius (1520-1564) first developed this method of using the numerical relationships of triangles to measure land, it was Gunter who used his expertise to improve and simplify the methods and tools for surveying in the field.139

Gunter’s work on standardization in surveying was consistent with the interests of Elizabeth I to discourage the “incessant variation, deceit, and falsehood in weights and measures,” that were common under her reign.140 Gunter found “the easiest way to measure out an acre was in the form of an oblong, 220 yards long by 22 yards broad, or, in a surveyor’s terminology, 40 perches by 4 perches.”141 The standard English mile was based on eight furlongs of 220 yards each, as a concession to English surveyors.


139 Gunter published in English, as opposed to Latin, which made his innovations available to common men surveying land or navigating the seas. One of his contemporaries paid him a tribute: “He did open men’s understandings and made young men in love with that studie [math]. Before, the mathematical sciences were lock’t up in the Greeke and Latin tongues and lay untoucht. After Mr. Gunter, these sciences sprang up amain, more and more.” The complete collection of Gunter’s works was printed in English in 1624. From Linklater, Measuring America, 15.

140 Queen Elizabeth I had been keenly interested in new standards for weights and measures. Accurate measurement was essential for England’s mariners “who used Gunter’s cross-staff and quadrant to find latitude in the trackless ocean” and was critical to natural philosophers such as Francis Bacon “who advocated measurement and experimentation as the basis of science.” From Linklater, Measuring America, 25 and 27.

141 Ibid., 26.
Two centuries later, breaking with English tradition, Thomas Jefferson designed a precise land division system based not on this easily surveyed oblong, but the square. At the same time that European nations sought to allocate land to their citizenry through irregular lots based on natural features or the long lot system, Jefferson seemed obsessed with using the perfect square. Why? Unlike Gunter’s oblong lot, one square acre would result in the mathematically inefficient length of 208.71 feet or 69.57 yards to a side. A section of 640 acres, one mile per side, could be quartered into 160 acres, or quartered again into sixteen parcels of 40 acres to retain the efficiency of Gunter’s chain and the shape of the square. However, the square lacked efficiency for farming and ease of communication between farmers that were inherent in longer lots or topographically based lots measured by metes and bounds. Applied as a grid across the vast territories of the mid and western U.S., it also lacked conformity to the curvature of the Earth with its converging north-south lines. These and other problems inherent in the square as a fundamental unit of land division suggest that Jefferson’s plan rested as much on ideology as on his efforts to enhance efficiency through a more simplified and objectified survey system.

JEFFERSON’S INTEREST IN CLASSICISM AND THE SQUARE

Jefferson’s independent proposal to rely on the square for surveying and apportioning new American territories reflected his interest in building the new republic on the foundation of a democratic division of property and Enlightenment values, which he
believed were best reflected in classical archetypes. Jefferson was attracted to the Greek and Roman style of architecture, based on simple geometric form, as most vividly expressing the republican ideals of the new nation. “In favoring classical architecture Jefferson was selecting not just a style that appealed to him, but one that he believed was in harmony with the fundamental principles of the universe.”

Jefferson, classical architecture expressed eternal principles first discovered by the ancients, which he hoped to revive in the new republic. After thousands of years, he and his American equals “had recovered the truths, first hinted at in Greece and Rome, that men could govern themselves, that the authority for government came from the people governed to their ruler, and not vice versa.”

Jefferson convinced the directors in charge of building the Virginia capitol to base their design on “the square . . . exemplified in the Maison Carrée,” or “House of Squares,” which, according to Jefferson, was “the most perfect and precious remain of

142 Jefferson’s survey design was first proposed in 1784 to a committee appointed by Congress, which he headed, to consider the conditions for sale of western lands to pay war debts to France and other creditors. Jefferson drafted an ordinance, which called for surveying tracts in ten geographical miles square and subdivided to lots of one-mile square. At the time there were two opposing groups: the “democracy group” (Jefferson and John Adams) advocated for rectangular survey and parceling out land for individual ownership whereas the “conservative group” (Alexander Hamilton and John Jay) advocated for large grants at low prices to companies or wealthy men who would use metes and bounds to determine lot boundaries, thereby ensuring good quality land. Jefferson’s plan drew objections and went back to committee. The final decision altered his plan slightly (not using hundreds but keeping the squares) while he was away in France. This plan became the Land Ordinance of 1785. See White, History of the Rectangular Survey, 10-11. In addition, the original thirteen states “agreed to transfer their land claims if Congress assumed all the states’ Revolutionary War debts and if the proceeds from sales of the western lands would benefit all the states.” From Miller, Native America Discovered and Conquered, 41.

143 Meyer, Myths in Stone, 173.

144 Ibid., 174.
antiquity in existence” and “has pleased, universally, for near two thousand years.”145 Jefferson described the Maison Carrée to James Madison as “very simple, but it is noble beyond expression, and would do honor to our country . . . a specimen of taste in our infancy, promising much for our maturer age.”146 By contrast, Jefferson selected the circle, as exemplified in the Roman Pantheon, to grace the federal Capitol. Both the “square and the circle represented the simplest and purest forms, evoking the perfection implicit in a new and revolutionary beginning.”147

The building designs of the "Academical Village" at Jefferson’s University of Virginia incorporated classical features such as domes, columns, squares, and "temple front" porticoes. These elements provide a visual expression of Jefferson's democratic and republican political values: “The architects of Greece and Rome created only simple shapes. . . . cube, hemisphere, cylinder, cone—each has its quiet and immediate access to the understanding, not of one people, but of all peoples.”148 Jefferson believed that classicism would “elevate the taste” of the new republic. His conscious use of ancient models reflected his belief that “beauty could be defined within the mathematical forms of classical architecture.”149 His own Monticello was based on the design of the Villa Cornaro ora Gable designed by the sixteenth century architect

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147 Meyer, Myths in Stone, 48.
149 Frederick D. Nichols and James A. Bear, Jr., Monticello (Monticello, VA: Thomas Jefferson Memorial Foundation, 1982), 19.
Andrea Palladio, whose designs replicated Greek and Roman temple architecture. Both plans feature a square entrance hall flanked by square rooms on either side. At Monticello these rooms became known as the South Square Room and the North Square Room.\footnote{Ibid., 31, 42.}

In helping to design the new District of Columbia, Jefferson chose the republican Rome as the “model for the American experiment in democracy.”\footnote{Meyer, \textit{Myths in Stone}, 42.} The new capital would reflect the strong emphasis on centrality in the urban plan and architecture of Rome. The name “Tiber” would replace that of Goose Creek, and the term “Capitol,” derived from Rome’s “Capitoline Hill,” would serve to designate the meeting place for Congress.

Jefferson’s proposed layout for the District exemplified order and symmetry — a perfect square ten miles on a side and divided into smaller squares.\footnote{The ten square mile size limitation for the federal city is contained in Article I of the U.S. Constitution.} The perfect square grid is also reflective of the ancient designs of the Greek cities of Athens and Sparta. The initial plan was centered on the intersection of a north-south meridian line and east-west baseline — a point intended for the Capitol building. The actual site moved slightly eastward, but planners maintained the central symbolism and used the actual location of the Capitol to divide the District into Northeast, Northwest, Southeast, and Southwest quadrants. This same technique would later be applied to cadastral surveys of the U.S. territories with the conjunction of the meridian and...
baselines generally meeting at the mouth of a river and separating the four quadrants of townships and ranges.

Both planning systems reflect the centuriation, a system of surveying employed by the ancient Romans. The basic unit was the centuria, which was made up of one hundred square heredia (equivalent to about 132 acres). Each centuria was laid out by the “measurers of fields” (agrimensors) using a cross-staff. “At its center, a north-south running axis, the cardo maximus, intersected an east-west running line, the decumanus maximus, dividing the surveyed areas into four quarters.”153 Inscriptions left on stone markers at the center revealed the religious relevance of this act: left rear for the northwest, left front for the northeast, and so on relate to the position of the augur (Roman religious interpreter) facing east, with the northeast and southeast quarters in front of him.

According to historical geographer Hildegard Binder Johnson (1908-1993), the centeredness of this system is an expression of Roman thought on the cosmological meaning of ‘center,’ which is related to that of the square. The term ‘square’ is derived from both the Latin quadra and quarter (from quartarius, “or the fourth part, as in ‘quartering’ a circle”). The quadra implies a form in equilibrium and carries a static meaning within ancient Roman cosmology. The ‘quarter’ is more dynamic, representing the quartering of the circular horizon by the augur who stands at the

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153 Johnson, Order Upon the Land, 28.
center facing east — a religious act by which stability would be achieved through the orderly delimitation of fields by the agrimensores.\textsuperscript{154} Although scholars have yet to find a direct connection between Jefferson’s survey scheme and the Roman system of centuriation, the model resonates especially well with Jefferson’s proposal to base the public lands survey system on hundreds.\textsuperscript{155} Jefferson’s well-documented interest in classical architecture and literature and his ability to read both Greek and Latin certainly provided many opportunities for him to learn about the Roman system and its ideological significance.

\textbf{MASONIC INFLUENCE}

Jefferson could also have been influenced by the Masonic symbolism of the square as representing virtue, integrity, and character — the foundation for a moral society. Jefferson participated in Masonic ceremonies and demonstrated sympathy for its ideals. Many Enlightenment thinkers, including several framers of the Constitution were high-degree masons (for example, Benjamin Franklin, Rufus King, and George Washington), as were many of the free thinkers with whom Jefferson fraternized in France, including Condorcet.\textsuperscript{156}

A Masonic rite was conducted for placing the cornerstone of the University of Virginia in 1817. It was led by grand master Alexander Garrett and attended by Thomas Jefferson, James Madison, and President James Monroe. President Monroe

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\textsuperscript{155} Johnson, \textit{Order Upon the Land}, 30.
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“applied the square and plumb, the chaplain asked a blessing of the stone, the crowd buzzed, and the band played ‘Hail Columbia’. A Masonic ritual also accompanied the laying of the cornerstone for the Capitol. Similar rites took place for three later cornerstone ceremonies at the Capitol in 1818, 1851, and 1859. Masonic rites were also performed at the Washington Monument in 1848 and marked the beginning of construction for many government buildings. The ritual ceremonies metaphorically imitated the call for great care and attention in forming the new government, for, as George Washington remarked, “if the foundation is badly laid, the superstructure must be bad.” The ceremonial role of the Masons eventually faded, as the Anti-Masonic Party formed in the 1830s successfully attacked their privileges, secrecy, and elitism.

The Masonry symbolism of the square and the mason’s trysquare (used to test the straightness of a right angle) is built on ancient ideas. The trysquare was an emblem of “accuracy, integrity, and rightness.” As stones are cut to fit into a building, so the masons thoughts and actions built a structure of character, “badly or firmly . . . tested by a moral standard of which the simple try-square is a symbol.” The square

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158 The Capitol also reflects Masonic tradition in being oriented to the four cardinal directions and facing east. This is in accord with Solomon’s Temple, which some have argued signifies “to the monarchs and people of Europe the dawning of ‘a new order of the ages.’” From Meyer, *Myths in Stone*, 39 and *Washington D.C.: A Smithsonian Book of the Nation’s Capitol* (Washington, D.C.: Smithsonian Books, 1992), 77.
159 Len Travers, “‘In the Greatest Solemn Dignity’: the Capitol Cornerstone and Ceremony in the Early Republic,” in Donald R. Kennon, *A Republic for the Ages: The United States Capitol and the Political Culture of the Early Republic* (Charlottesville, VA: University of Virginia Press, 1999), 159.
symbolized morality and the basic rightness, “which must be the test of every act and
the foundation of character and society.” To the Masons, it was a “symbol of that
moral law upon which human life must rest if it is to stand.” An inscription found
on an old brass square with the date 1517 was found in 1830 under the foundation
stone of Baal’s Bridge near Limerick, Ireland. It read: “I WILL STRIVE TO LIVE — WITH
LOVE & CARE — UPON THE LEVEL — BY THE SQUARE.”

In her work on the history of European Masonic lodges, historian Margaret Jacob
quotes an excerpt from an early anonymous Masonic tract emphasizing that
“domestic units built by masons” serve as the very foundation for a prosperous civil
society:

Some of our brethren from their exalted situation in life, rolling in their
chariots at ease, and enjoying every luxury, pleasure and comfort, may with
strict propriety be considered as standing on the basis of earthly bliss,
emblematic of the greater square, which subtends the right angle. Others whom
Providence hath blessed with means to tread on the flowery meads of
affluence, are descriptive of the square, which stand on the sides which form
the right angle.

In France, the philosophical principles of the Enlightenment were grounded within the
Masonic lodge. Here free men came together ‘on the level’ to consider new modes of
self-government. Secrecy was sometimes employed to shield their efforts from those
who felt threatened by their revolutionary ideas. In a letter to Bishop James Madison
(1749-1812), president of the College of William and Mary, Jefferson spoke

162 Mackey, Encyclopedia of Freemasonry, 840.
sympathetically about the efforts of a German Freemason reformer, Adam Weishaupt. Weishaupt created the “Order of Illuminati of Bavaria” for which he was assailed by French and German ecclesiastical and monarchical leaders fearing he was secretly conspiring to end their authority. Jefferson claimed his detractors actually feared “the spreading of information, reason, and natural morality among men.” He sympathized with Weishaupt’s belief in “the indefinite perfectibility of man” and “the diffusion of science and virtue” through Freemasonry.

MORE THOUGHTS ON JEFFERSON’S SQUARE

In Common Landscape of America, 1580 – 1845, historian John Stilgoe acknowledged Jefferson’s “strong attachment” to the square form. He claimed Jefferson’s land survey plan was “a model example of Enlightenment abstraction, a perfect scheme for ordering a wilderness tabula rasa.” But, he claims, not all settlers agreed.

Settlers had long assumed that topography indicated the best outlines for future towns and lots, and most tracts conformed to soil types, elevations, and water frontage. Squareness mandated a departure from this so-called natural practice, and for decades settlers hesitated before choosing a tract congruent with fertile soil or open grassland and one clearly and permanently surveyed in a square.

Stilgoe argues that phrases such as ‘a square deal’ and ‘he’s a foursquare man’ “entered the national vocabulary as expressions of righteousness and fairness as a result of the grid.” Stilgoe neglects to mention that the association of moral

165 Ibid., 1077.
166 John R. Stilgoe, Common Landscape of America, 1580 to 1845 (New Haven, CT: Yale University Press, 1982), 103.
167 Ibid., 101.
168 Ibid., 106.
concepts with the square dates back to antiquity and, in English usage, to at least the sixteenth century. According to *The Oxford English Dictionary*, the meaning of “square” as “just or equitable; fair, honest, honourable, straightforward” in phrases such as “square deal” dates to 1591. The etymology of “square” begins with the Latin *quadra* and relates to shaping an object, such as stone, such that it has perfect right angles. Squaring the angle means the stone will fit ‘on the level;’ it will be ‘true.’ This led to applying the term to the ‘measure of a man.’ In English usage, “square” became widely used to signify character and virtue in the seventeenth century: “honest or straightforward in dealing with others,” “solidly or firmly constituted,” “in a fair, honest, or straightforward manner; without artifice, deceit, fraud, or trickery,” and “upon terms of equality or friendship with another or others.” *The Oxford Dictionary* supports the latter meaning with the quotation: “They chose rather to be lorded over once more by a Tyrant . . than endure their Brethren and Friends to be upon the square with them.” *Oxford Dictionary* also acknowledges the association of the square with the Masons: “Having membership of the Freemasons; in accordance with the Masonic code.” Thus, Jefferson likely chose the square to measure the newly acquired American lands in part *because* of the virtues it engendered, rather than his system inspiring an extended meaning after the fact, as Stilgoe suggests.

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170 Ibid.
171 Ibid. The date given for this meaning is 1692.
172 Ibid.
Jefferson believed cultivators of the land would serve as the virtuous basis on which to build a democratic society. “Those who labor in the earth are the chosen people of God, if ever he had a chosen people, whose breasts he has made his peculiar deposit for substantial and genuine virtue. It is the focus in which he keeps alive that sacred fire, which otherwise might escape from the face of the earth.”\(^\text{173}\) The ancients may have helped inspire these ideas as well. In his *Literary Commonplace Book* and elsewhere, Jefferson recorded praises of the pastoral life by Roman poets such as Horace and Virgil. In his *Politics*, Aristotle “elevated the life of the husbandman above all other modes of acquisition, while ranking the activities of the businessman, unrestrained by any natural limits in his pursuit of wealth, as worse than that of a pirate.”\(^\text{174}\) Jefferson’s admiration for the philosophy of Adam Smith may also have inspired him. In his *Theory of Moral Sentiments*, Smith “contrasts the effects of agricultural and commercial economies on individual character” and claims the variety of tasks and skills employed by the independent farmer makes him “far superior” to the urban factory worker whose narrow tasks are but a cog within the manufacturer’s division of labor.\(^\text{175}\)

Jefferson argued that America’s best interests would not be served by an economy based on manufacturing, but, rather, by one based on agriculture. “Carpenters, masons, smiths are wanting in husbandry: but, for the general operations of manufacture, let


\(^{175}\) Ibid.
our work-shops remain in Europe.”176 To him, the virtuosity that was inherent in agricultural communities was severely lacking in crowded cities, where the laboring masses gathered near industrial centers. “The mobs of great cities add just so much to the support of pure government, as sores do to the strength of the human body. It is the manners and spirit of a people which preserve a republic in vigor.”177 Jefferson took it as his duty to open up lands in a rational, efficient manner to realize his ideal that the “earth was given as a common stock for man to labor on.”178 And the perfect square was the adopted symbol of land provision on which he would build this virtuous democracy just as the Mason relies on a perfect cube for the cornerstone on which to build a solid structure.

**UNINTENDED RESULTS OF THE GRID**

In *Trust in Numbers*, Theodore Porter describes the objectification of nature as a means to further social goals. He uses the rectangular grid survey as a case in point. Although surveyors were perfectly capable of charting the positions of rivers and using contour lines to depict landforms in detail, and land surfaces could be objectified in a variety of ways, the “square grid has usually been preferred by central governments on account of its greater simplicity.”179 Once in place, land claims could be registered and enforced from administrators far away, “with a bare minimum of

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177 Ibid.
judgment or local knowledge.”\footnote{Ibid.} Porter claims such measurement “aspired to independence from local customs and local knowledge. In this they were allied to the centralizing state and to large-scale economic institutions.”\footnote{Ibid.}

In *Seeing Like a State*, James C. Scott similarly claims that by making territories and societies legible, which he describes as measurable and controllable, governments can impose and maintain their authority. “These state simplifications,” he writes, are “like abridged maps.” They don’t actually replicate what is there, but “when allied with state power, enable much of the reality to be remade.”\footnote{Scott quoted in John Gaddis, *The Landscape of History: How Historians Map the Past* (Oxford: Oxford University Press, 2002), 144.} He claims the standardization of weights, measures, languages, and time zones consistent with the scientific understanding of natural laws gives greater weight to general principles than to a complex of individual circumstances. In this way, “one seeks legibility while neglecting accountability; one prefers straight lines intersecting at ninety-degree angles to the irregularities and asymmetries of the natural landscape.”\footnote{Ibid., 144.} Historian John Gaddis takes the argument further by suggesting that “architectural blunders” (like the square grid) are actually “acts of oppression [which] are almost always justified as acts of liberation.”\footnote{Gaddis, *Landscape of History*, 144-145.}

Jefferson’s own ideal purpose, however, was not “state power.” Though Porter’s assessment of the *outcome* of applying the square grid has validity, his argument of the initial *purpose* misses the mark, as do the arguments of Scott and Gaddis. Jefferson
considered efficiency and simplicity in developing his method, but his objective was not control by a centralizing state. He had in mind allowing individuals with common knowledge and surveyors with basic mathematical skills to be able to measure and map lands simply and efficiently. For Jefferson, complicated and difficult systems meant opportunity for manipulation by those exerting authority or special expertise. Land speculators were prone to manipulating the complex metes and bounds system to their own benefit.\textsuperscript{185} Jefferson sought to create a land measurement system for the benefit of the republic and to promote an agrarian based economy. In general his work to develop a standardization of weights and measures was an integral part of developing democratic systems based on rational thought and scientific systems.

Historian Peter Onuf argues that Jefferson believed “precisely because a despotic central government did not seek to impose order, ‘every man, at the call of the law, would fly to the standard of the law, and would meet invasions of the public order as his own personal concern.’”\textsuperscript{186} Onuf suggests that in Jefferson’s “empire of liberty” the only role of an active federal state was to “clear the way for settlement through diplomatic negotiations with imperial neighbors whose success depended on a credible threat of force.”\textsuperscript{187} This required “removal of Indian nations as distinct political societies that could threaten the security of the federal republic or block its continuing expansion.”\textsuperscript{188} Jefferson was not opposed to “a few civilized Indians” blending into

\textsuperscript{185} See Linklater, \textit{The Fabric of America}, 170-171.
\textsuperscript{186} Peter S. Onuf, \textit{The Mind of Thomas Jefferson} (Charlottesville: University of Virginia Press, 2007), 115-116.
\textsuperscript{187} Ibid., 116.
\textsuperscript{188} Ibid.
the tide of white settlement and, in fact, hoped for such an outcome. But the civil agrarian society would be built under Jefferson’s plan, and land was essential to its success.

Nonetheless, Jefferson’s system of squares for dividing land was not readily adopted elsewhere. The land apportionment systems used in European countries had been employed in the New England states as well as in the Canadian provinces under French and British rule. Lots were often oblong (e.g., the original ‘acres’ of England being 22 yards by 220 yards) with the narrow end fronting on a road or river, resulting in community-oriented arrangements. These ‘long lot’ configurations encouraged the construction of homes close to transportation routes, allowing for easy communication with neighbors, and, in the case of river lots, ready access to water. An individual farmer’s cultivated land would stretch behind the house with long fields allowing for less turning of oxen teams. This allowed for more cultivation, with less time, labor, and land lost to turning a cumbersome plow and team of oxen. It was not until the mid-nineteenth century that improvements to the plow and the use of draft horses expedited plowing, including the turning process.189

Rufus Putman, principal surveyor for the Ohio Company (a private land investment group) advocated for such lots in Ohio, before its being carved into squares

189 For more on development of the plow and use of oxen and draft horses, see Lillian Church, *History of the Plow* (Beltsville, MD: United States Department of Agriculture, 1935) and Donna C. Smith, *The Book of Draft Horses: The Gentle Giants that Built the World* (Guilford, CT: Lyons Press, 2007).
under the Land Ordinance of 1785. He argued that the congressional system of sections was not an equitable system in areas dominated by slope. He surmised that without long river lots, few people would have access to the flat terrain along principal rivers, and these areas afforded the best quality farm land.

In his *Report on the Lands of the Colorado* (1879), explorer John Wesley Powell (1834-1902) made a case for adjusting land laws in the arid West to match geographical conditions. He explained that water, not land, was the most significant factor if settlement and cultivation were to succeed. “The lands along the streams are not valuable for agricultural purposes in continuous bodies or squares . . . it would be greatly to the advantage of every such [arid] district if the lands could be divided into parcels, governed solely by the conditions under which the water could be distributed over them.” Furthermore, “the people settling on these lands should be allowed the privilege of dividing the lands into such tracts as may be most available for [irrigation] purposes, and they should not be hampered with the present arbitrary system of dividing the lands into arbitrary tracts.” Powell explained that irregular lots could be as accurately surveyed and platted as rectangular ones, without relying on the outdated methods that led to vague property descriptions under metes and bounds.

Another problem with the square configuration was that it encouraged settlers to build houses near the center of their holdings, thus providing ready access to their

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190 An exception to the rectangular survey in Ohio was those lands within the Virginia Military District, which were surveyed, in the traditional metes and bounds. See White, *History of Rectangular Survey*, 41-42.
191 See White, *History of Rectangular Survey*, plat map on p. 25.
fields but greater isolation from transportation routes and neighbors. For the common 160-acre square claim (one-quarter section), this would mean a half-mile between houses as a direct distance. But the distance became even greater by road. Section lines often became the alignment for roads, especially over flat land. Thus, from a centered house, one would have to travel to the road (about one-quarter mile), then travel a half-mile to the neighbor’s track and another quarter mile to their home, for a total of one-mile to visit even the closest neighbor. In 1893, E.V. Smalley wrote in the *Atlantic Monthly* of this condition. He said it was causing “An alarming amount of insanity . . . in the new prairie states among farmers and their wives.”\(^{193}\) Smalley recommended a solution, to wit, all farmers should “agree to remove their homes to the center of the tract” and thus create a village with their land redistributed outward from the center. He claimed this arrangement would attract people “of such a sociable, neighborly disposition as would open the way to harmonious living.”\(^{194}\)

On the vast expanse of the Great Plains, the square grid became particularly prominent across the landscape. It determined the “size and shape of counties and townships, influenced the location and density of homesteads, and even prescribed much of the Great Plains road network . . . [which were run] along section lines regardless of the natural terrain.”\(^{195}\) This orientation extended to agriculture, as well, determining the size and shape of fields and influencing orientation of buildings. It

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\(^{194}\) Ibid., 231.

had been standard practice among the early Pennsylvanians to orient their barn so that
the front, with its long overhang and related cattle yard, faced southeast, away from
prevailing winds. This traditional practice “ceased when farm structures were aligned
with the prevailing north-south and east-west survey and boundary lines.”196 In Jewell
County, Kansas, farm properties ran along section lines, as did the fences bordering
the homesteads. Given that fields ran parallel to property boundaries, they too became
oriented with the cardinal directions. Farmers tended to plow furrows in straight lines
parallel to their field’s boundaries, regardless of slope. This resulted in gullying,
erosion, soil loss, and rapid runoff of precious rain as straight cardinal lines often ran
with, rather than across, the slope. A condition called “soil washing” reduced crop
yields and the tendency to “farm on the square” meant that slopes kept “creeping
higher . . . and the speed and gnawing power of water increased accordingly.”197

Although residents in Jewell County might well have appreciated Jefferson’s “goal
in designing the survey: the creation of an egalitarian society of yeoman farmers that
would ensure independence from a potentially tyrannical federal government,”
drought and dust, together with financial woes, overwhelmed them by the 1930s.
Agents from the U.S. Soil Conservation Service assisted farmers by designing a
watershed-based demonstration project promoting contoured furrows and terraces
based on slope, regardless of square boundaries. Farmers within the Limestone Creek
watershed abandoned their rectilinear furrows in favor of curvilinear crop rows. It

196 Jeffrey J. Gordon, “Aboriginal Cultures and Landscapes” in A Geography of Ohio,
worked, and farmers beyond the demonstration area adopted the practices as well. The result was greater moisture retention and fertility in soils, allowing them to diversify the types of crops that could be successfully grown.\textsuperscript{198}

The grid’s impact on the health of the land was far reaching. By the middle of the twentieth century, pesticides and large-scale farm machinery allowed for expansion of fields to their furthest extent. Stream and roadside vegetation, which inhibits cultivation and produces unwanted dispersal of weed seeds, was gradually eliminated further revealing the grid when viewed from an aerial perspective. Streams today are often bent at right angles around fields and property lines. Roads often follow straight paths, regardless of terrain, resulting in greater use of fossil fuels to climb hills that otherwise might have been avoided. Forests are clearcut along straight property lines creating distinct, unnatural boundaries rather than the non-linear fluctuation of natural forest boundaries.\textsuperscript{199}

Nevertheless, it was not only the rationalistic and ideological squares that detrimentally altered the landscape. America’s obsession with property rights encouraged exploitation. Andro Linklater claims, “While most Western nations had land laws restricting individual property rights in favor of social needs, the United States had the opposite. Combining the legal concept of ‘fee simple’ with the Fifth Amendment—‘nor shall private property be taken for public use, without just compensation’—the law protected the property owner from almost all government

\textsuperscript{198} Ibid.
\textsuperscript{199} The ability to analyze these changes and compare landscapes around the world is immediately available through the technology of Google Earth available at \url{http://earth.google.com}. 
interference so long as taxes were paid.”200 Americans became monarchs of their property, entitled to do what they pleased as long as it did not infringe on their neighbor’s property. Aldo Leopold in 1949 lamented that there “is as yet no ethic dealing with man’s relation to land and the animals and plants which grow upon it. . . . The land-relation is still strictly economic, entailing privileges but not obligations.”201

No doubt Thomas Jefferson and the other architects of the American landscape sought to improve conditions for humanity, as best they knew. Their goal was the removal of oppression and tyranny, to relieve individuals of false doctrines imposed by government or church authorities. Although their personal lives sometimes contradicted their lofty ideals (as was the case with Jefferson, especially in his ownership of slaves), the American ‘architects’ worked diligently to realize their goals for the new republic. The scientific revolution and worldwide explorations unleashed a powerful new knowledge to humanity, and the greatest thinkers struggled to put this new knowledge to its highest use. Jefferson’s system of land survey and apportionment served his initial goals well. But he failed to anticipate its ultimate impact.

The ecological health of the American landscape severely declined as natural capital was extracted at a rapid rate. Although it was not his intention, Jefferson’s land apportionment system accelerated this decline. The virtues he hoped would be cultivated through classical archetypes and an agricultural base are now shrouded by

200 Linklater, Measuring America, 233.
201 Aldo Leopold, A Sand County Almanac and Sketches Here and There (NY: Oxford University Press, 1949), 203.
an advanced technological society where farmers are also industrialists, and electronic
gadgets supply myriad forms of information and entertainment that minimize the
archetypal structures so prominent in the early days of America. The disquieting
ecological and social consequences of reducing complex, interrelated landscapes to
simple squares, in concert with an emphasis on private property rights that has
superseded obligations, indicate further revolutions of thought may yet occur.
CHAPTER THREE: TRANSFORMATION OF THE WALDO HILLS LANDSCAPE

The Waldo Hills are situated on the east side of the mid-Willamette Valley, serving as foothills to Oregon’s Cascade Mountains. Much of the landscape today has the look of an English countryside: a broad expanse of hilly grass fields and pastures, sometimes capped by one lone oak, with pockets of maple, fir, and oak gracing steeper slopes, meandering brooks, and sheep grazing near well-kept old barns. Although by no means a wilderness, the pastoral spaciousness feels far removed from a city. From a hilltop view, one takes in the broad sky with occasional clouds appearing close enough to touch, while looking obliquely across the Willamette Valley southwest to Mary’s Peak and north to the Coast Range west of Portland. The landscape may seem largely unchanged from the time the first white settlers arrived. Perhaps it is only slightly different than it was over the hundreds, or thousands, of years previous when the Kalapuya and Molalla people maintained rights to this land.

This chapter questions these impressions and explains the historical basis for present conditions. It describes the landscape of the Waldo Hills before and after the 1851 public lands survey and includes a review of the surveyors’ methods and tools employed on the ground to accurately survey and map the Oregon territory. The regional focus provides a case study for assessing the impact of the rectangular survey—both literally and as a symbolic reflection of the shift from an indigenous worldview to the Western worldview. Jefferson’s grid began to take shape immediately as a result of the survey and continues to be a transformative factor,
together with the American belief in the utilitarian value of privately owned and managed land.

The focus of this study is primarily on one square township of the Waldo Hills: “Township Seven South Range One West.” The hills were named for Daniel Waldo, an influential settler who traveled to the Oregon country during the “Great Migration” of 1843 and was one of the first to stake his claim in the high country, apparently to avoid the ‘ague’ so common in the lowlands of his home state of Missouri. The hills are situated nine to sixteen miles east of Salem, running north and south between Silverton and Sublimity and covering elevations from 400 to 800 feet. They were originally formed over sixteen million years ago when molten lava from the Columbia Basin flowed through gaps in the old Cascade Mountains. Humans have inhabited the area for at least 13,000 years. Northwest historian Stephen Dow Beckham claims archaeological evidence shows that people lived along the Cascade foothills

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long before they moved down into the valley, likely to avoid flooding and wet conditions on the valley floor, especially at the end of the last glacial period.\footnote{Stephen Dow Beckham, \textit{The Indians of Western Oregon} (Coos Bay, OR: Arago Books, 1977), 23.}

Before American settlement and the rectangular survey, only forested canyons and meandering streams interrupted the hills’ open savannas and prairies. The first government surveyors in 1851 described the land as “hilly and Broken but not enough so as to prevent a general Cultivation,” mostly “Prairie with the Exception of strips of Timber along the Streams,” and “well watered with Springs and Mountain Streams.”\footnote{General description by surveyors of Township 7S and Range 1W from the U.S. Bureau of Land Management Land Status and Cadastral Survey Records website at: \url{http://www.blm.gov/or/landrecords/survey} p. 0587.0. Accessed 15 February 2008.} Though the surveyors described a land already marked by American settlement over the previous decade, these marks were insignificant compared to the ecological conditions created and maintained by native people over the previous millennia.

A central component of this Waldo Hills case study is to meticulously study the surveyors’ notes and redraw the original township map to more precisely depict the historic landscape. The result is a picture of the landscape at the juncture between two distinctly different cultures — cultures with disparate views about the human relationship with the land. To provide a visual basis for describing the landscape before and after American settlement, I will begin with a discussion of the survey itself, including the maps created from the surveyors’ measurements and observations.
THE 1850 DONATION LAND CLAIM ACT AND CADAstral SURVEY

The earliest settlers in the Oregon Territory were primarily retired French and British fur trappers and missionaries. They used topographic features to delineate their land claims according to the traditional metes and bounds system of the English colonies and the long lot, or rang, systems of the French. The sharply declining native population had enabled the early settlers “to hold land through simple preemption and use.” As the number of American immigrants over the Oregon Trail sharply increased, the Provisional Government of the Oregon Country moved to create a more orderly development pattern and legalized land claims. They specified requirements under Article III of the Oregon Organic Act of 1845, anticipating U.S. federal land legislation once the land boundary dispute with Britain was settled. The legislation reflected the settlers’ desire for “more uniform regulation of metes and bounds.” Under Article III, land claimants were “required to conform boundaries as nearly as possible to the cardinal points of the compass and to make permanent improvements

207 One can still see the difference in development pattern in the French prairie area near St. Paul and Gervais, “The field pattern is irregular, since the farms were laid out helter-skelter before the Donation Land Act was passed” in Dicken and Dicken, The Making of Oregon, 16. See also Atwood, Chaining Oregon, 109-112.


six months of the time of entry and no individual was permitted to hold more than 640 acres at one time [and] in square or oblong form.”

The U.S. Congress ultimately passed the Oregon Donation Land Claim Act of 1850, which set into law Jefferson’s system of squares that would further dictate ownership patterns throughout the territory. The primary author of the Act was Oregon Territory delegate Samuel Thurston. He and Methodist missionary Jason Lee had long been vocal advocates for increasing settlement and developing the Oregon Territory. Several years before Thurston wrote the bill, Senators Lewis Linn and Thomas Benton from the state of Missouri advocated making Oregon an American territory and establishing legal land claims for white male settlers: 640 acres each if they would cultivate it for five consecutive years. Although Linn and Benton were not successful in their 1842 and 1843 campaigns, anticipation of eventual passage of such legislation encouraged the Great Migration of 1843 and eventually led to the 1850 Act.

The first Surveyor General of Oregon, John B. Preston, was appointed in 1850 and traveled from his home in Chicago, Illinois to Washington in March 1851 to be briefed by General Land Office Commissioner Justin Butterfield. All surveys were to use a solar compass to establish true north from solar readings, rather than from a magnetic

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211 Ibid.
213 Both men were later honored by having Oregon counties named for them. See Lester B. Shippee, “The Federal Relations of Oregon – III, Chapter V, Linn and the Oregon Territory,” *Oregon Historical Quarterly* (December 1918), 291.
needle, and observe magnetic variations (now termed ‘magnetic deviation’). The Donation Act required surveyors to establish six by six mile townships unless the land is “deemed unfit for cultivation.”215 The Act required that topographic features also be identified and mapped. Preston gathered his survey equipment, which consisted of four solar compasses, transits, sextants, and Gunter chains. He traveled to Oregon by the quickest route at the time: a ship to Panama, by land over the Isthmus, then by ship to Oregon City, where he established his office in May, 1851. Preston acted quickly to appoint surveyors to establish the Base Line and Willamette Meridian.216 He drove the “starting stake” into the earth on June 4, 1851 in the hills just west of Portland near the mouth of the Willamette River.217

The Willamette Meridian and Base Line intersect at what was the heart of the Oregon Territory and would become the gathering site for trade to and from Oregon for years to come. This site was aptly named Portland — a place that “enjoyed strategic advantages as a distribution center by virtue of its natural water routes to upstream markets on the Columbia and Willamette and across the Columbia bar to the oceanic highways beyond.”218 Like a physical heart taking in and pumping blood to its various destinations, Portland would become the central place for taking in and moving goods, most raw but some finished, to destinations across the U.S. and around

217 A state park commemorates the site today with an historic marker that reads in part, “The establishment of the [Willamette] Stone was the start of the sectionalizing of the Pacific Domain on the north Pacific Coast . . .” From Maynard Drawson, Treasury of the Oregon Country (Salem, OR: Dee Publishing Co., 1973), 70.
218 Robbins, Landscapes of Promise: The Oregon Story 1800-1940, 102.
the world. The Donation Land Claim Act’s author, delegate Thurston, anticipated the importance of this site for commerce. Much of the Territory’s natural resources would be gathered and sent from here “to a rapidly expanding and industrializing global economy.”

Was the Oregon Donation Land Claim Act primarily intended to make land available for Jefferson’s yeoman farmers or to extend the reach of industrial centers in the East? Metaphorically speaking, the grid represented the casting of a net far across the continent to capture the bounty of land and natural resources. From 1850 to 1853, large allotments of free land encouraged the difficult trek west across uncharted lands still held by native peoples. For those who had arrived earlier in anticipation of American possession, 640 acres or one square mile (a whole section) could be claimed by married couples who could prove they had lived on the land for at least four consecutive years. Unmarried men were entitled to 320 acres if they were white citizens and no ‘less’ than “half-breed Indian.” A woman whose husband died before the claim was patented could still claim half of the 640 acres in her own right, an opportunity not previously granted to women. People arriving after passage of the Act, could claim 320 acres per couple or 160 acres for a single man until December 1, 1853.

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219 For further discussion on the exploitation of Western resources to fuel the “Atlantic-centered industrial economy” see William Robbins, *Colony and Empire: The Capitalist Transformation of the American West* (Lawrence, Kansas: University of Kansas Press, 1994), 62-63.

The U.S. surveyors set out across the countryside of the Willamette Valley in the summer of 1851 and began surveying lines in the Waldo Hills in September. Deputy Surveyor George W. Hyde headed the survey crew for this area with T.W. Davenport and Robert Paxton serving as “Chainmen,” and M.L. Hutton as the “Axe Man.”\textsuperscript{221} The rattle of Gunter’s chain would have been heard as the chainmen followed a deliberate line cleared by the axe-man. The straight north-south and east-west lines crossed the land, regardless of slope, swamp, or thick vegetation. The axe man cut a path through any trees or brush impeding the line of sight. For each segment, the chain was pulled tight and level by the two chainmen, a tally pin was dropped into the ground, and a stake pounded in at that point. At each half mile, either the quarter point of a square mile section or its corners, a survey marker was made by “planting a post or mound, either of earth or stone.”\textsuperscript{222}

“Witness trees” recorded the bearings relative to each quarter or corner mark. The surveyors carved the proper letters and numbers into the tree’s trunk by scraping off the bark and cutting through the cambium layer to dead wood, ensuring the scribing

\textsuperscript{221} From the document certifying the surveyors carried out their duties as assigned, “Sworn and Subscribed before me at Waldo Hills Country of Marion in the Territory of Oregon this 19\textsuperscript{th} Day of October AD 1851. Geo W Hyde, Dept Surveyor.” Taken from U.S. Bureau of Land Management Land Status and Cadastral Survey Records website at: http://www.blm.gov/or/landrecords/survey Township 7S and 1W, p. 0696.0 – 0697.0. Accessed 15 February 2008.

\textsuperscript{222} Quoted from the surveyor oath taken on the “19\textsuperscript{th} day of October A.D. 1851” by T.W. Davenport and Robert Paxton for surveys done in the Waldo Hills. From U.S. Bureau of Land Management Land Status and Cadastral Survey Records website at: http://www.blm.gov/or/landrecords/survey pp. 0696.0 – 0697.0 accessed 18 February 2008.
will remain as the bark re-grows to cover the scar.²²³ An experienced surveyor can identify the scar—sometimes with the bearing marks showing through the re-growth, otherwise by cutting back to the inscription. Long-lived white oaks were often chosen as the surveyors’ witness trees. The oaks would guide later surveyors to the point on the land described in their notes and depicted on a map.

The following is a summary of the survey notes recorded in the field for the line walked between sections 27 and 28:

Magnetic variation was noted as 19° 35’ E, then they proceeded 10.00 chs (chains) “to foot of slope.” At 13 chs they “touched the W side of Spring branch Course North.” At 15.00 chs they “commence ascending.” At 25.00 chs they reach the “top of rise” and at 31.00 chs they cross a road that courses “N 20° E and S 20° W.” At 39.40 chs they cross the “same stream 8 lks [links] wide, course N 60° W. At 40.00 chs they set the “quarter section post from which W [white] Oak 12 in. bears N 23⅓° E 92 lks” and “W Oak 8 in. bears N 11° W 75 lks.” At this quarter section point of 40.00 chains, the surveyor apparently uses his solar compass to determine true north again and notes the variation as 21° 00’. At 42.00 chains, he notes: “Mr. King’s house is about 20 chs East.” At 56.00 chains, they cross the Territorial Road, which courses N 10° W. At 57.50 chains they reach the “top of hill.” At 60.00 chains and again at 61.50 chains, they cross the road again. At 61.50 chains they also note that the “NE corner of Gears [sic] field is 10 lks west runs NW & SW.” At 70.50 chains they cross the road again. At 80.00 chains they “Set Post Cor [corner] of Sec 21, 22, 27 & 28 from which a W Oak 40 in. dia. bears S 41 W 13.5 lks.” Two other white oak trees of 10 inch and 24 inch diameters are given bearings. At the end, they note “R C Gear’s House bears N 73° W about 15 chs distant. A high point in Coast Range bears N 52° 50’ W. Latitude by observation 45° 08’.” The notes include elevation changes at regular intervals.²²⁴

²²³ David F. Louden, Jr., PLS, Marion County Surveyor’s Office, email letter to author, 3 November 2009.
Along with the detailed section line notes, the surveyors recorded an overall description of the township noting the quality of the land for cultivation:

This Township is considerably above the common average. The surface is hilly and broken, but not enough so as to prevent a general cultivation. The Land is principally all claimed by actual settlers, about ¾ of the Township is prairie with the exception of strips of timber along the streams. The NW Quarter of the Township is timbered principally with Fir which has a very thick [undergrowth] of Hazel, Alder, Vine Maple & Fern. The whole Township is remarkable well watered with springs & mountain streams. The soil is well adapted to grazing [sic] & wheat growing.225

The original plat map of Township 7S Range 1W was drawn in 1852 based on the descriptions of the surveyors along the boundaries of each of the thirty-six square sections (see Figure 1). The cartographer had to estimate the conditions inside each section using only the surveyors’ descriptions. An analysis of the surveyors’ notes and comparison to the map revealed that the map had a few mistakes, such as omitting some roads, omitting or displacing some streams, and misplacing houses.

225 By “actual settlers” the surveyors were referring to those who had made actual improvements and lived on the land claimed, rather than speculators. This was important to meeting the provisions of the Donation Land Claim Act. The reference to cultivation was also intended to document that the land they surveyed qualified for being surveyed in sections, not just township lines, to meet the requirements of the Act and get paid for their work. General description of Township 7S Range 1W from the U.S. Bureau of Land Management Land Status and Cadastral Survey Records website at: http://www.blm.gov/or/landrecords/survey Township 7S and 1W, p. 0590.0. accessed 18 February 2008.
More than one hundred fifty years later, the surveyors’ notes were used to help create an historic vegetation Geographic Information Systems (GIS) layer. The Oregon Natural Heritage Information Center worked with the General Land Office historical

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surveys to create the historical vegetation maps as part of their mission to “identify the plant, animal, and ecological community resources of Oregon.”227 Their methodology for determining conditions inside the sections was based primarily on the density and types of witness trees noted at corners and quarter sections as well as present-day soil surveys. The ecologists’ comprehensive effort resulted in a GIS layer that distinguishes several historic ecosystem classifications across Oregon. The work on Township 7S Range 1W (Figure 2) resulted in delineation of eleven different classifications existing at the time of the 1851 survey. Drawing upon the report, “Classification of Historical Vegetation in Oregon, as Recorded by General Land Office Surveyors,” I have constructed the legend for Figure 2.228

Although the Oregon Natural Heritage program’s classifications and GIS map layer are more scientific than the map I created (shown as Figure 3), the Heritage map does not express all the historic factors captured by the surveyors — e.g., the historic stream network, cultivated fields, roads and trails. The surveyors’ extensive field notes for one township capture eighty-four miles of observations, noting changes in vegetation, elevation, waterways, roads, trails, cultivated fields, land claimants’ houses, mills, stores, and general conditions. For the map in Figure 3, I translated the notes to trace conditions along each section line and interpolated the interior of the

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227 From the Oregon State University’s Oregon Natural Heritage Information Center website at http://oregonstate.edu/ornhic/, accessed 3 November 2009.
Figure 2: Oregon Natural Heritage Program Historic Vegetation - Township 7S Range 1W

PU – dry upland prairie/grass/forbs
SO – oak savanna/grass/forbs
SOF – oak/fir savanna/herbaceous
FF – fir/maple/alder
FFHC – mixed upland conifer
HSS – shrub swamp/marshy thicket

FFO – fir/oak/maple/shrubs
PW – wet prairie/willow/ash
FOA – riparian oak/ash
SF – fir savanna (no oak)
OFOZ – fir/oak/brushy

\(^{229}\) Digital map emailed from Edward Alverson to the author, 14 November 2008.
section based on U.S. Geological Survey (USGS) 7.5-minute topographic maps, the
Natural Heritage historic vegetation map, aerial photos, field observations, and
ecological studies.\(^{230}\)

The map in Figure 3 depicts an aerial view of the landscape with colors that relate
to a late summer view, the season in which the surveys were conducted. The dominant
golden color represents a mix of upland prairies and savannas that vary from a low to
a high density of large, spreading Oregon white oaks (*Quercus garryanna*). The more
dense “oak openings,” essentially oak woodlands, are colored a pale green. What the
surveyors’ called “principally fir timber” is shown in the darkest green, consisting
primarily of Douglas fir, grand fir, western red cedar, and Pacific yew. These forest
areas generally grew along riparian canyons and steep north-facing slopes, as well as
the lower bench lands around the Pudding River — shown in the northwest quarter of
the township. Riparian vegetation and “marsh” lands (wet prairies) were generally
located along the floodplains of waterways.

\(^{230}\) In addition to Christy, Alverson, et. al. “Classification of Historical Vegetation in
Oregon, as Recorded by General Land Office Surveyors,” the following ecological
studies were used: “Native Oregon Prairie Species of Waldo Hills Area,” unpublished
document compiled by Lynda Boyer, Oregon Heritage_seedlings, and sent
electronically to author on 31 March 2009; Mark V. Wilson, “Upland Prairie:
Contributed Chapter, Part I of the U.S. Fish and Wildlife Service Willamette Basin
Recovery Plan,” (Portland, OR: U.S. Fish and Wildlife Service Oregon State Office,
1998); and, E.R. Alverson, “Use of a county soil survey to locate remnants of native
Sheviak, and D.J. Leopold (eds.) *Ecosystem Management: Rare Species and
Museum Bull., 1989). The specific USGS maps consulted were “Stayton NE
Figure 3: Hand Drawn Map of Township 7S Range 1W c. 1851

- Upland prairie & oak savanna
- Oak openings
- Conifer forest
- Riparian trees/shrubs
- Cultivated fields
- Roads
- Trails
- x conifer
- oak
- ash/alder/maple/willow
The small dark green ‘xs’, dots, and filled-in squares represent the surveyors’ witness trees: ‘x’s are firs or western red cedar, dots are Oregon white oaks, and squares are other types of deciduous including big leaf maple, Oregon ash, red or white alder, and cascara. The oaks predominated as witness trees likely due to their extensive presence across the prairie/savanna landscape. However, when given a choice, the surveyors likely chose oaks for their strength, longevity, and relative lack of value as lumber; i.e., a witness tree needed to survive as long as possible through future surveys and land divisions.

The map’s rectangular shapes filled with lines represent the extent of cultivated land noted by surveyors, and the small, open squares are the settlers’ homes. Note that about half the fields are rectangles oriented to true north, in anticipation of the survey. Two mills existed in 1851 as well: English’s flouring mill next to the Pudding River (on a lower elevation near farmlands) and Smith’s saw and flouring mills on Silver Creek (at the downstream end of Silver Creek canyon and upstream of present day Silverton).

Note the large Beaver Pond between sections sixteen and twenty-one. Surveyors described this pond, and its adjacent flooded marsh, as 660 feet wide and one to fifteen feet deep. Beaver Creek is a small perennial stream. The size of the beaver pond described by the surveyors is impressively large and would require a considerable colony of beavers to build and maintain such a dam. It is especially unusual given that fur trappers had extensively worked over the area the previous three decades.

The roads and trails would primarily have been Indian trails prior to white
settlement. The map clearly shows they were guided by the most easily forded stream crossings and were generally located to avoid steep slopes and wide marshlands. The *Historical Atlas of Early Oregon* refers to such trails as “behavioral roads.” They began as a “common pattern of getting from one place to another” which were not definite tracks but might pass certain landmarks along the way. Then, “at some points there would be very little choice such as at the ‘gaps,’ or in fording a stream.” No roads or trails showed up at this time in the swampy Pudding River lowlands. Land transportation at this time was largely by horseback and wagons drawn by teams of oxen. Routes favored the drier hill country during much of the year or on the valley floor during the dry season.

A major north-south trading route to Willamette Falls ran through the middle of the township. Known as the Molalla Indian Trail by early settlers, it was generally surveyed in 1848 by order of the Provisional Government and named the East Side Territorial Road. It served as a major route for travel from Jacob Spore’s Ferry on the McKenzie River north to Oregon City. The “East Side Territorial Road . . .

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232 Overland travel was more limited on the valley lowlands due to wet conditions over wide swaths, such as the Pudding River area shown in this township. Most roads were short tracks to the nearest river landing and wagon travel was mostly limited to dry summer months. See Dicken and Dicken, *The Making of Oregon*, 77-78.
followed early Indian trails along the higher ground of the foothills, for the valley was high in mud in winter, high in tall grass in summer.” Prior to bridges and road developments, major north-south trails stayed on higher ground on either side of the Valley to avoid “beaver dams and other obstructions” especially “in the wintertime when water tended to spread out.”

The Klamath Indian Trail ran north on the eastern side of the township. This trail served as a major trade route for native people on either side of the Oregon Cascades. It ran from southeastern Oregon, crossing the Cascades at the Santiam Pass, and joining the “Molalla Indian Trail” (Territorial Road) north of this township, near present day Mt. Angel. After the survey, the Klamath Trail was renamed the Meridian Road for the newly established Willamette Meridian, which forms the east boundary of the township.

Once the survey was completed, the rationalized name for the Waldo Hills location was created: “Township 7 South Range 1 West,” derived from its location relevant to the juncture of the Willamette Meridian and Base Line. All surveys in the new

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Since 1826 (Eugene, OR: chuck query, 2008) p. 16. Contrast with the “West Side Old Territorial Road,” which followed the Applegate Trail from Dallas, Oregon south on the west side of the Willamette River. See Benton County Museum website: www.bentoncountymuseum.org.

234 Lucia Wilkins Moore, “The Mitchell Wilkins — Pioneers Of 1847” in Lane County Historian (March 1962), 4. Ms. Moore was the granddaughter of Mitchell Wilkins who arrived in Lane County in 1848. Her grandparents’ first two homes were built on the East Side Territorial Road, as described in the diary of her father, Marion Wilkins.


237 Donation Land Claim Act of 1850.
territory were referenced to these lines. So, “Township 7 South” is seven townships (or 42 miles; i.e., seven times six miles) south of the Base Line and “Range 1 West” is the first township west of the Meridian.

With the survey complete, the land of the Oregon Territory had been ‘drawn’ into square miles that were measured in chains — an apt metaphor for measuring land to be individually owned for the first time and utilized for profit. The chained land would be provided free to encourage its productive use to further the American goals of expansion and progress. Yeoman farmers pressed westward in hopes of realizing their individual goals for land ownership and becoming part of the great civilizing of an ‘untamed wilderness.’ But, at this time, the rights to use the land were still held by the native people.

The newly constructed legal arrangements redefined landscapes that native people had formerly treated as a commons . . . Land increasingly became a commodity, a thing of value in the marketplace. To justify that new set of conditions, the newcomers refurbished the old argument that they practiced superior methods of cultivation and represented a more advanced civilization. The rights of native people, who enjoyed the legal status of “prior occupancy” under constitutional law, entered the debate only when incoming white settlers pressured the federal government to extinguish Indian title to the land.238

The native people had claimed rights to the lands’ bounty, but never owned it. No written deed or map bore witness to their claims. The Oregon Territorial Act of 1848 acknowledged the Indians’ constitutional rights so long as such rights remained “unextinguished by treaty,” but no such treaties existed at the time of the survey.239

The president of the United States was given authority to appoint commissioners for

238 Robbins, Landscapes of Promise, 83.
239 Ibid., 84.
the purpose of negotiating such treaties with Indians, with the goal of securing the most cultivatable lands west of the Cascade Mountains. Initial attempts were made before the surveyors’ arrival, but these failed ratification. It was not until 1857 that superintendent of Indian affairs Joel Palmer successfully garnered all Willamette Valley lands from the dwindling populations of Indians and removed them to the newly created Grande Ronde and Siletz reservations. He chose lands for the reservation that “were separate from the Willamette Valley, inaccessible from the sea, and . . . lacked agricultural potential.”

EARLY LANDSCAPE AND KALAPUYA MANAGEMENT

The people of the Pudding River (ha’nt’cyuk) band of the Kalapuya were most likely the primary users and caretakers of the Waldo Hills. Generally, land was divided among bands according to watershed boundaries and all the streams of this township drain to the Pudding River. However, the Pudding River band was hit hard by disease and those few who remained may have joined with the Santiam (ha’laam) Kalapuya, whose treaty negotiations in the 1850s included these lands. The Molallas very likely hunted and traded here as well, though their homelands were primarily on the higher slopes of the western Cascades. Historic maps designating traditional boundaries are not consistent, nor precise enough to determine the actual limits of their territories.

240 Ibid., 85.
numbers of native people remained; most had succumbed to smallpox or malaria in the pandemics of the preceding decades. A malaria epidemic in the period from 1830-1833 was particularly devastating for the Kalapuya.\textsuperscript{243}

In an interview by anthropologist Melville Jacobs in 1928, Santiam Kalapuyan John Hudson said the land was once good. “No one labored. Only a man went hunting, he hunted all the time. Women always used to dig camas, and they gathered tarweed seeds. Such things were all they ate. They gathered acorns, they picked hazelnuts, they picked berries, and dried blackberries.”\textsuperscript{244}

Explorer Charles Wilkes traversed the Willamette Valley in 1841, when white settlements held close to the Willamette River and its major tributaries for access to river transportation and the Hudson’s Bay Company at Willamette Falls (present-day Oregon City). Wilkes found that French Canadian fur trappers, retired trappers from the Hudson’s Bay Company, Catholic and Methodist missionaries, and small numbers of other American and English immigrants had settled in this area.\textsuperscript{245}


\textsuperscript{245} See Charles Wilkes, \textit{Narrative of the United States Exploring Expedition during the Years 1838, 1839, 1840, 1841, 1842} (NY: B. P. Putnam & Co., 1856) and Melinda Marie Jette, “we have allmost Every Religion but our own: French-Indian Community Initiatives and Social Relations in French Prairie, Oregon, 1834-1837,” \textit{Oregon Historical Quarterly} Summer 2007
At the time of the Wilkes’ expedition, the Kalapuya had already suffered considerable losses from foreign diseases starting with a westward migration of smallpox in 1782-1783 but with the greatest losses sustained in 1830-1833, when malaria was brought on a European ship from the Hawaiian Islands.\(^{246}\) Wilkes estimated that the Indian populations within the area of missionary influence included 600 Kalapuya with a total of 2,000 in the entire region.\(^{247}\) Much earlier, in 1805-1806, Lewis and Clark estimated 9,000 Kalapuya inhabiting most of the Willamette Valley.\(^{248}\) Historian Peter Boag estimates that the Kalapuyans had a maximum population of 13,500, “roughly fifty people per one hundred square miles, during the last quarter of the eighteenth century” just prior to contact with Europeans.\(^{249}\)

Wilkes was impressed by the appearance of the land, still largely under the influence of Indian management, the last known accounts of which occurred in the early 1840s. Some areas already showed signs of being untended, as Wilkes notes, “since the whites have had possession of the country, the undergrowth is coming up

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rapidly in places."²⁵⁰ It had not been long enough, however, for widespread alteration to take shape from neglect or settler cultivation. He described bottomland prairies, which were “one-third greater in extent then the forest: they were . . . carpeted with the most luxuriant growth of flowers, of the richest tints of red, yellow, and blue extending in places a distance of fifteen to twenty miles.”²⁵¹ Overall, the valley “appears as if much improved by hands of civilization.”²⁵² He described entering the woods at the edge of a prairie and being surprised at their “appearance of being attended to and kept free from undergrowth.”²⁵³

Wilkes was aware that the Indians’ use of fire resulted in hills covered with “wallflowers, lupines, scilla, and quantities of ripe strawberries.”²⁵⁴ He mentioned that, not only did the fires clear land to maintain desirable vegetation, but also the burning of “sunflowers” [tarweed] produced plentiful, nutritious seeds that were harvested soon after the burn. Scottish botanist David Douglas (1799-1834), in an earlier expedition through the Valley in September of 1826, described the recently burned-over land as leaving only patches of verdure “in the valleys and on the flats near the low hills.” He explained that some “natives” said the burning was to urge deer into certain areas for hunting while others claimed it was done “in order that they might better find honey and grasshoppers, which both serve as articles of winter

²⁵¹ Ibid., 111-112.
²⁵² Ibid., 116-117.
²⁵³ Ibid., 118.
²⁵⁴ Ibid., 119.
food." Burning also encouraged growth of the Kalapuyan’s staple food, *Camassia quamash* or camas, which occurred primarily in the seasonally wet prairie bottomlands of the valley and along major river systems, as well as smaller streams and wetlands. Thick forests dominated by Douglas fir, grand fir, big leaf maple, vine maple, hazelnut, and fern grew primarily on north-facing slopes and ravines in bordering hills. Broad gallery forests consisting of Douglas fir, Oregon ash, cottonwood, willow, alder, and maple bordered bottomland streams and rivers. The Waldo Hills provided a rich variety of wildlife habitat as well as food and other materials for the Indians and early white settlers. The streams and associated ponds harbored trout, beaver, otter, waterfowl, crawdads, freshwater mussels, and eels—all of which were important to the native people. Sweat lodges would have been constructed near water and encampments were often located where trails crossed rivers and streams.

The miles of forested canyons harbored game for hunting as well as a wide variety of berries, medicinal herbs, and woody shrubs. Several shrubs thrived along forest edges and in forest openings. They were important for basketry materials, bows and

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258 Don Day, Grand Ronde Tribe Cultural Protection Specialist, interview by author, 5 April 2009.
arrows, and sweat lodge construction (e.g., willows, ninebark, red osier dogwood, ocean spray, and hazelnut). The upland prairies grew tarweed and oak acorns in abundance, and the low valleys and wet prairies were rich with camas — all important resources for the native people.

The Kalapuyans’ extensive use of fire enhanced the rich variety of foods and increased biological diversity. Nature Conservancy ecologist Ed Alverson compiled native plant lists for the Waldo Hills, which reveal that eighty-one different native grasses and forbs (broad-leafed herbaceous plants) were in the upland prairies. The wetland prairies included more than ninety species, some of which could be found in both areas. A total of 146 different plant species once thrived here (not including trees and shrubs).

The hilltop prairies were burned annually, usually in late August or early September. The Kalapuya did this primarily to harvest one of their principal foods—tarweed seed. Tarweed grew about thirty inches high and had a clear, tarry substance

on the head and stock. At maturity, the area was burned leaving “the plant standing with the tar burned off and the seeds left in the pods” (see pictures in Figure 4). The women would beat the stalk dropping the seedpods into a long conical basket specifically designed for this purpose, which was slung across their chest.

Figure 4: Tarweed Plant with Seeds and Mortar/Pestle from Historic Geer Farm

The seeds were ground into meal using a mortar and pestle like the one shown in Figure 4, which was found at the historic Ralph and Mary Geer farm in the middle of the township.

Historian Robert Boyd, calls the Kalapuyan’s practice “so frequent and widespread that it maintained what ecologists would call a ‘fire climax’ biotype.” Their burning kept the prairies in an early successional stage. This favored a blend of annual and perennial species with extensive root systems that were fed by nutrients made available through burning. The fire resistant Oregon white oaks thrived here as well. These massive wide spreading oaks provided shade, structure, and food for humans

260 Boyd, Indians, Fire and the Land in the Pacific Northwest, 14. See also the account of settler George Riddle quoted in Robbins, Landscapes of Promise, 36.
261 Boyd, Indians, Fire and Land, 128.
and a diversity of animals and birds. The abundance of flowering plants, interspersed with tall grasses, benefited butterflies, grazers, and ground birds. Oregon’s state bird, the Western meadowlark, is a ground nester that once thrived here but is now rarely seen in the valley.

The Kalapuya burned oak openings to maintain open land beneath for a variety of plants and easy harvest of acorns. Fire was used on a smaller scale in the forests and wet prairies to create abundant berry harvests, grow new hazel and willow shoots for baskets, and to cultivate a native variety of tobacco (*Nicotania quadrivalvis*, var. *multivalvis*) for ceremonies. Fire also assisted their harvest of grasshoppers, crickets, and yellow jacket larvae.

The Indians’ use of fire in the Waldo Hills maintained a biologically rich landscape that featured open prairies with a mixture of grasses, forbs, and scattered oaks, and forested areas along streams and rivers containing berries, skunk cabbage, hazelnut, bracken fern, and a wide variety of useful plants. Without fire, the land would have become mixed woodland with Douglas firs crowding out oaks and the development of thick underbrush — exactly what settlers observed once the fire practices stopped. In his diary about daily life in the Waldo Hills during the 1850s

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and 1860s, Fones Wilbur often mentioned “cutting brush” and using a “brush scythe” to clear fence lines and to generally maintain the land.264

The Indians’ maintenance of the mosaic enhanced productivity for themselves and other species—some, but not all, of which served as food. According to geographer Jerry Towle, “An open landscape made hunting easier and, more importantly possessed a greater carrying capacity for animals than did forest regions. The fine-grained pattern of grove, gallery forest [floodplain forest] and prairie provided many miles of ‘edges’ or ecotones where animals found easy access to food and cover. Early accounts describe the Valley as an exceptionally productive game area, particularly for deer and elk.”265 Over two hundred vertebrate species thrived in the prairie complex such as the acorn woodpecker, western meadowlark, western gray squirrel, white-breasted nuthatch, sharp-tailed snake, ten species of bats, a host of invertebrates (including several butterfly species), more than fifty species of grasses and a wide variety of forbs.266

The Kalapuya readily traded items they gathered in abundance with others whose land did not produce the same, especially hazelnuts, camas, and deerskins. In return the Kalapuya especially prized “dried, pulverized salmon,” shells, and tool making

264 Fones Wilbur entries, 27 March, May, 7 July, September 1862, 29 July 1863, from Fones Wilbur diary, Oregon Historical Society.
265 Towle, “Changing Geography of Willamette Valley Woodlands,” 73.
266 Information on native species from Campbell’s Restoring Rare Native Habitats in the Willamette Valley and Habeck’s “The Original Vegetation of the Mid-Willamette,” 76.
stones such as obsidian and chert. The salmon returned vital minerals from the ocean, washed off the land from high rainfall, thus benefiting humans and entire ecosystems of the interior valleys. Salmon thus completed an essential nutrient cycle for species in the Northwest, but few salmon reached Kalapuya lands. According to Wilkes, “fish of the upper waters are said to be hardly edible, and, compared with those caught at the mouth of the Columbia, are totally different in flavour.” Only small runs of spring Chinook (*Oncorhynchus tshawytscha*) and steelhead trout (*Oncorhynchus mykiss*) made it past the Willamette Falls to spawn in upper valley tributaries. Their only chance to breach the natural dam was during the high waters of winter and early spring.

The Kalapuyan’s seasonal use of the Waldo Hills could well have been as Boag describes:

In the summer, large portions of the native population retreated to the foothills. There men hunted with bow and arrow, pitfall traps, and snares, and women preserved hides and furs of captured game. They also picked and preserved ripening wild cherries (*Prunus emarginata*), elderberries (*Sambucus cerulea* and *S. rocemosa*), huckleberries (*Vaccinium parviflorum*), hazelnuts, and bracken (*Pteridium aquilinum*), patches of which the women burned at the end of the season to ensure vigorous growth and production the following year. At sites adjacent to streams in the foothills, the Kalapuya worked oak, yew (*Taxus brevifolia*), and cedar boughs into tools. At the end of summer, they moved back down to the floor of the Willamette . . .

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This account is consistent with artifacts found on the Wilburn King land claim in sections twenty-seven and twenty-eight of this township: small arrowheads of chert, a quartzite scraper for processing hides, and a basalt metate for grinding nuts. Several additional food sources could have been gathered here such as bark from the *Cascara sagrada* tree, which Indians made into a medicinal tea. Rootstalks of horsetails that grew in the Beaver Creek floodplain could have been gathered and prepared as “a ‘sweetish’ delicacy for special ceremonies.” Large skunk cabbage leaves gathered from wetlands near beaver ponds could have been used to wrap fruits and vegetables before cooking in a pit dug into the clayey earth. Cooked fruits would also have been wrapped in these leaves and buried in the wetland clay to preserve them for later consumption.271

Although the Kalapuyans were not consciously acting as ecologists, their practices worked for the local ecology. Their use of fire over hundreds of generations established an important symbiotic relationship with other species.272 Their communal effort benefited communities that included, according to their view, not just humans but also beaver, otter, bear, eagle, wolf, plants, trees, and even rocks, water, sky, and the wind. Their taking of food, skins, shelter, and basketry materials was done by necessity but not without acknowledgement of the plants’ and animals’ embodied spirit and their independent right to exist.

The Kalapuya served as users and caretakers of their sacred land, not its owners. This belief was universal among tribes of the Northwest, as present-day tribal historians explain:

To the Indian, there was only one place where he belonged — in his homeland made sacred by the ageless sleep of his ancestors, made fruitful by the spirit of his children yet unborn. Here and only here could the life rhythm of his race beat on in unbroken harmony. To tribes all over the land, the earth was their mother, wise and loving in her care for her children. . . . Land belonged to all the people, to use and to cherish. That one man could claim a piece of the earth for himself, to hold against all others, was as unthinkable in Indian philosophy as it is to you and I [today] that one may keep a piece of the sky above us, the sky that in this present day conception is the one thing man must share in common.273

The land’s abundance was not taken for granted. Rituals were an important part of maintaining harmony and productivity. Wilkes recalls an incident traveling upriver from Willamette Falls by canoe with an Indian guide: “This part of the river is considered dangerous when the water is high . . . the Indians in passing are still in the habit of making a propitiatory offering of some of their food, such as dried salmon or peas, in order that they may have a safe passage by.”274 Robert Rilatos, whose father was from the Rogue River tribe and his mother from the Molalla, recalled: “. . . the Indian people gave thanksgiving to everything, and this was one of their ways of rewarding the river, they would leave some of their precious gems, jewels, or whatever, on this particular rock, because they were so instructed by the Great

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Spirit.”275 The Indians believed “plants and animals gave their lives so that humans could live; but in return, humans had to follow ritual in their treatment of [them].” Salmon and animals understood their relationship to humans, but, not only sentient beings, “Camas, *kouse*, huckleberries, and other plants also had life, being, and spirit. They understood their relationship to spirit.”276

Before reaching adulthood, Indians were initiated through “spirit quests” alone in the wild where they remained a few days until they made contact with the power spirit that would become their guardian for life. These guardians often took the form of animals that “aided in the flow of life by providing strength, guidance, and protection to individuals in their quest for food, shelter, and village harmony. By maintaining a balance with the spirit world and generally peaceful relations with their neighbors, . . . [the Kalapuya] flourished through the centuries.”277

When white settlers arrived, some believed the spirits fled. William Hartless, alleged to be one of the last Kalapuyans to grow up under the ‘old tribal ways,’ explained:

Now there are no more spirit-powers. But long ago there were many, when only Indians still lived here . . . But now there is nothing any longer in the water like long ago. And it is gone the very same way in the mountains,

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275 Robert Rilatos, interview by Janice Tiland, transcription of tape recording, 24 July 1975, Oral History Collection, Oregon State University Archives.
everything that lived in the mountains, which the Indians made to be their spirit-powers, they are gone now. They all went back to the ocean.  

In an interview by anthropologist Melville Jacobs, Santiam Kalapuya John B. Hudson recounted a long-told story about the prophetic dream of a Santiam shaman. The shaman said he saw in his dream that the “earth was all black.” Hudson explained that later on, “the rest of the people saw the whites plough up the ground. Now then they said, ‘That must have been what it was that the shaman saw long ago in his sleep.’”

The Indians’ close relationship with the land—its abundance and its spirits—came into sharp conflict with the white immigrants who settled there in the 1840s – 1850s. Historian Peter Boag explained, “Europeans and Euro-Americans began to arrive in the Willamette region around 1800. They introduced into this environment new pathogens, new plant and animal species, a linear conception of time, and a new intellectual relationship with nature.” The application of the grid across the landscape was another intellectualization. It efficiently carved the land into privately owned segments that could be more easily described and mapped — all geared toward preparing the land for exchange in the capitalist marketplace. The multi-dimensional and multi-scale landscape of the Kalapuya was soon transformed into two dimensions,

with straight, intersecting lines replacing a curvilinear landscape, the idea of progress replacing cyclical timescales, and individual ownership replacing communal rights.

The Americanized Landscape

When John Waldo traveled to the Oregon Territory in 1843, along with sixty head of American cattle, he left behind “the lowlands of Missouri, where he had suffered sorely from ague, and here, he thought, in this elevated region, at once bountifully watered and wholesomely drained, were conditions assuring relief from the malarial curse of his former home.”281 He chose the hill country on land that later became Township 8S Range 2W and marked out his field oriented toward magnetic north. In the manuscript of an 1878 interview conducted by the secretary to historian Hubert Bancroft, Waldo talked of living alongside the surviving Indians who, he said, gave no trouble “until the missionaries intervened.”282 He saw lots of “mountain Indians,” likely Molallas, and said, “They were friendly fellows.” He recalled that wolves were plentiful and “ate up lots of horses,” but, by using “nux vomica” [Strychnine], he was able to kill them off in just two months. Waldo became a wealthy man, helping out new settlers and funding some of the Valley’s first industries. He served as legislator,

district judge, county treasurer, and was the father of Oregon Supreme Court Justice and wilderness preservationist John B. Waldo.\textsuperscript{283}

The Waldo Hills became a popular place for settlement after 1843. This was especially true compared to the “southern level plain between Eugene and Albany” which, in 1850, was “almost completely unoccupied, the settlers clinging to the edge of hills where wood and water were more readily available” and “the wet valley floor” could be avoided.\textsuperscript{284} The upland east side Territorial Road became a major route for traveling to trading posts at Oregon City. In 1857, just six years after the 1851 survey, the Territorial Road was resurveyed, moved and straightened, conforming more nearly to the pattern of north-south and east-west land boundaries.\textsuperscript{285} R.C. Geer, along with three of his neighbors, were appointed commissioners “to relocate that portion of the Territorial Road leading from Oregon City to Jacob Spore’s Ferry which lies between Drift Creek and the South line of Township 7 S R. 1 West in the County of Marion . . .” In October 1857 they met and subsequently recorded their actions in the document of record:

\textit{. . . met at Drift Creek Bridge in Said County on the 11\textsuperscript{th} day of October 1857 and after being duly Sworn proceeded to the discharge of the duties assigned them. They retained T.W. Davenport Surveyor and as directed by the act of assembly proceeding to locate and Survey Said road after plat and copy of field notes of which are herewith accompanying. They found this line of road indicated to be over an undulating Section of Country but practicable for the road and nearer and better than the original Survey.}\textsuperscript{286}

\textsuperscript{283} Ibid., 10, 13 and 7-18.
\textsuperscript{284} Dicken and Dicken, \textit{The Making of Oregon}, 81.
\textsuperscript{285} Document of Record, “Change Territorial Road, Oregon City to Jacob Spore’s” 10 December 1857, road history records of Marion County, Oregon, Marion County Surveyor’s Office archives, Salem, Oregon.
\textsuperscript{286} Ibid.
T.W. Davenport, the surveyor on the road realignment and one of the chainmen on the original survey for the township, also settled in the Waldo Hills. He married the daughter of nurseryman R.C. Geer and his wife Mary, whose land extended across sections twenty-one and twenty-eight. Davenport was an educated and Enlightened man — a surveyor, teacher, writer, farmer, shopkeeper, member of the Good Templars Lodge, member of the Oregon House of Representatives and State Senate, and Indian agent on the Umatilla Reservation.\(^{287}\) His reputation as a learned man earned him the distinction of the “sage of Silverton.” In a letter sent to his cousin Kate in 1870, Davenport extolled the bounty of Oregon’s landscape with its “rapid running streams of pure soft water . . . full of trout and salmon” and “considerable prairie land” with “well distributed timber.” He described good growing conditions for fruit and vegetables with “no insects to eat up our crops and no rust to injure” and “the most pleasing and exhilarating Scenery in the world.” Yet, he warned, “Don’t come here thinking to find this an Eden without forbidden fruit or a country where all are advantages to obviate labor or thought. We have our trials and troubles here as elsewhere.”\(^{288}\)

Oregon’s first native-son governor and cousin of Ralph Geer, T.T. Geer lived with his wife Nancy in section thirty-one of this township. In an 1898 interview as

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\(^{288}\) T.W. Davenport to Cousin Kate, Silverton, 10 April 1870, Davenport Papers, 1848-1966, Collection number Ax 242, Special Collections & University Archives, University of Oregon, Eugene, Oregon.
governor-elect he described his land as having two fine trout streams and “originally covered with a scattering growth of oak and fir trees” with many spaces “naturally open.” 289 He talked of clearing 120 acres of timber, much by his own hands. His farm took shape with eighteen acres in orchard, seventy-five in wheat, and the remainder in pasture and garden. The interviewer described it as a model farm, “very good to look at and pleasant and profitable, I judge, to own.” 290

T.W. Davenport’s talented son, Homer Davenport, became a distinguished and influential political cartoonist for the Hearst publications. In his 1910 autobiographical book, The Country Boy, Homer lamented the felling of a favorite “old oak” tree in the heart of Silverton at the north end of the township. The massive Oregon white oak had graced the center of Silverton as a “stately giant,” which became, according to Davenport, “a center of dignity around which we could build” and was befitting the “superb character of both men and women that made Silverton so distinctly different.” 291 For decades it drew people from town and surrounding farms to gather beneath its broad limbs. It was commonly believed that in the hundreds of years previous, it served as a meeting place for “the Molallas and Santiams” as they “went to and fro from the Council of the Great Multuomah [sic] Tribe on the Columbia River.” The day it fell, Homer believed Silverton and the surrounding countryside had forever changed. A “newer element with higher collars and smaller hats was in command.” The “best and bravest citizens had already gone

290 Ibid., 2.
beyond the call of human voice, others would soon follow, and the tree, being one of them, had, also, made obeisance to the demand of society, fashion and wealth.”

Daniel Waldo, T.T. Geer, and the Davenports all exemplify various aspects of the American worldview that took shape in this township, displacing the indigenous way. This view was built on the Enlightenment, with rationalism outweighing superstition, and the Protestant work ethic commanding a sense of industriousness that, when applied to the land, they believed would improve it. Jefferson’s yeoman farmer was the model they sought to emulate. Though romanticism came through in the letters and journal entries of some of the early settlers, the dominant force on the landscape was that of industry. Over time, competition, technology and an ever-expanding industrial economy displaced the simple, virtuous yeoman farmer. The American worldview continued to embody the essence of hard work and progress. Consider this reflective description from contemporary counselor, educator, and writer Garrett McAuliffe:

From the European American worldview came values such as an emphasis on individualism and autonomy, faith in problem solving that is action-oriented, the desirability of competitiveness and achievement, and materialism. These, along with an orientation toward the future, the maintenance of rigid time schedules, and a strict work ethic in which hard work results in both monetary and intrinsic worth, were all used to build a nation. Trust in rationalism and empiricism (i.e., the belief that reality is knowable and measurable through reason and observation), the imperative of self-discipline and self-monitoring, a belief in utilitarianism (i.e., what is useful is good and is morally superior), and the importance of thoughts and actions over feelings were all a part of the making of America.

292 Ibid., 17.
McAuliffe goes on to suggest that Americans believed their worldview was “the only possible ‘civilized’ view.” Under their direction, the land became civilized as well. But civilization is a human trait. When applied without consideration of the larger ecological systems operating across the landscape, the health of such systems diminishes. This is what occurred across the rural landscape of the Waldo Hills as the indigenous landscape first fell to the yeoman farmer, then to the industrial age within just a few generations.294

**WALDO HILLS IN THE TWENTY-FIRST CENTURY**

Today, the Waldo Hills landscape is significantly transformed. The grid is clearly visible in the shape of fields, except where woodlands follow canyon corridors and narrow bands of vegetation border some of the streams (Figure 5). The countryside is now a patchwork of various land uses based on owner preference and agricultural viability. It is no longer a mosaic of diverse ecosystems with trails and roads following natural contours. It has become a squared network of monoculture fields, fences, and highways. The old Territorial Road became Cascade Highway with streams of fast moving semi-trailer trucks and commuter cars, sometimes competing with slow-moving tractors. Walkers are only rarely seen and the few bicyclers that brave the narrow side-lanes do so as sport rather than transportation. The grass seed fields, which appear open and connected, are not, since one cannot simply walk across them without being considered a trespasser on private property.

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294 One case in point, Waldo Hills native Nadine St. Louis who lives today in Wisconsin, is the daughter of John Q. Small whose father, Matthew Small came across the Oregon Trail in 1853 as a teenager. Her great-grandfather, Thomas Small, made one of the last claims of free land in the Waldo Hills — just three generations ago.
Figure 5: Township 7S Range 1W in August 2005

Note the predominant squared pattern of the fields except where canyons and rivers intervene. Cascade Highway (and to a lesser extent, the old Klamath Trail) is largely straightened except where there are significant hills and stream crossings. Many secondary roads take right angles around land boundaries and section lines, as do those highlighted in the southeast quarter. The town of Silverton is located at the top, in the northeast quarter.
The 2005 aerial photo clearly depicts the pattern first drawn by the surveyors, except within the steep canyon areas along tributary streams. The gallery forests that were so prominent in the Pudding River floodplain were subsequently cut down and Chinese laborers grubbed out stumps to prepare the land for agricultural crops.

Willamette Valley settler David Newsom explained in 1880 that the “Chinese have been paid about ten dollars per acre for grubbing and 85¢ per cord for cutting the grubs into cord wood.” Farmers drained this lowland and other wetlands by installing underground pipes that now empty into roadside ditches and streams. Culverts and bridges allowed new roads and highways to cross landscapes where no roads or even trails existed before.

The vast majority of the cultivatable land in this township has been converted to cropland. Field observations and aerial photos indicate the upland dry prairies are now primarily grass seed (with occasional rotations to wheat or oats), vineyards, Christmas trees, and Oregon meadowfoam (*Limnanthes alba*). The only areas that escaped the plow were lands with substantial rock outcrops, very steep slopes, and the canyon ravines of Drift Creek, Silver Creek, Beaver Creek and the upper Pudding River. These areas are not cultivatable, but continue to be managed for timber, predominantly Douglas fir. Pasturage is a common secondary use, although most often on lesser slopes dominated by grass with remnant groves of Oregon white oak. In most pastures, cattle and sheep are given open access to waterways and graze on streamside

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296 The meadowfoam seed is pressed for its oil.
vegetation. The uncultivated lands are often subject to neglect. They may be planted with the required stocking of merchantable trees to meet state and county rules but often harbor invasive species such as Himalayan blackberry, English ivy, and Scot’s broom.

Few oak savannas or prairies remain in the Waldo Hills after just one hundred and fifty years since the survey first marked their predominance. Ecologists claim that native Willamette Valley “upland prairies, along with wetland prairies, now cover much less than one percent of their former area making them among the rarest of North American ecosystems”\textsuperscript{297} According to state wildlife ecologist Bruce Campbell, “on the valley floor much of the oak woodlands have been cleared for agriculture. Today only a few stands of oak remain, most either on foothills too rough to develop or around dwellings on old farmsteads.”\textsuperscript{298}

The oaks found in the “rough” areas of the Waldo Hills today are often crowded in thick groves where they cannot expand their branches outward and develop the typical open-form character that effectively flowers to produce acorns and provide habitat. Mature oaks that may have grown in an open setting are often found competing in the shade of fast-growing Douglas firs.\textsuperscript{299} Oregon white oaks require caretakers working to maintain their most favorable conditions. On the privately owned lands of today,

\textsuperscript{298} Campbell, \textit{Restoring Rare Native Habitats in the Willamette Valley}, 6.
\textsuperscript{299} Information on decline of Willamette Valley oak savanna ecosystem from Campbell, \textit{Restoring Rare Native Habitats in the Willamette Valley} and Dave Vesely and Gabe Tucker, \textit{A Landowner’s Guide for Restoring and Managing Oregon White Oak Habitats} (Oregon: Pacific Wildlife Research, 2004).
most are suffering a state of decline from lack of such caretakers. An Oregon white oak restoration handbook states, “less than 1% of oak-dominated habitats [in the Willamette Valley] are protected in parks or reserves. Private landowners hold the key to maintaining this important natural legacy.”

Marion County provides a special assessment for maintaining private land as wildlife habitat, including rare ecosystems such as prairies and oak savanna, but, to date, just eighty-eight acres out of the 23,040 acres in this township are so designated.

Six prairie plant species endemic to the Willamette Valley are now endangered. Others, which still grow elsewhere, are rarely found in the Waldo Hills today.

It is a rare sight to see old growth native trees, whether they are Douglas fir, Oregon white oak, or western red cedar. The land on the boundary line between sections twenty-seven and twenty-eight (see yellow line in Figure 6) is one of the few where old growth fir trees remain in this township. Their noticeable ‘broken tops’ create essential perches for large raptors and cavities for other birds and small mammals. Their thick, complex bark harbors insects, bats, and voles helping to preserve the food chain and the nutrient cycling system of the forest.

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301 The 88 acres enrolled in the wildlife program is entirely on the author’s farm, with 46 acres managed specifically for wildlife habitat.
302 See Campbell, Restoring Rare Native Habitats, and Boyer, Native Oregon Prairie Species.
303 For information on benefits of old-growth trees for habitat and forest health, see Chris Maser, Forest Primeval: The Natural History of an Ancient Forest (San Francisco: Sierra Club Books, 1989).
Soils of many of the agricultural fields today serve primarily as a substrate for crops rather than nutritive parts of an ecosystem. Industrial farmers apply chemical fertilizers and the crops are treated with pesticides derived from fossil fuels. Many of the grass seed fields receive annual applications of chemicals such as Dimethoate (a highly toxic insecticide), Phenoxy herbicides (broad leaf defoliants), Banvel 2,4-D (highly toxic general herbicide), fungicides to control ‘rust’ (especially when burning is restricted), chemical fertilizers, and poisonous bait for mouse/vole and/or slug control. These chemicals and other pollutants from intensive agricultural activities often end up in waterways. A 2008 report on water quality conditions in the Pudding River basin found “A number of waterbodies within the M/P-NS [Molalla-Pudding-North Santiam] Subbasins are water quality limited for one or more parameters, including temperature, dissolved oxygen, pH, legacy pesticides, metals, toxics, nitrates, fecal coliform and bacteria.” In a U.S. Geological Survey report on pollutants and their relationship to land use in the Willamette Valley, the Pudding River basin showed the greatest number of dissolved pesticides of forty-nine sites.

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304 Ioka Farms agricultural field operations schedule from “Wildlife Habitat Conservation and Management Plan” approved by Oregon Department of Fish and Wildlife for landowner, Tina Schweickert, October 2005. For toxicity of chemicals, see Pesticide Information Profile prepared by Cornell University in cooperation with Oregon State University, Michigan State, and UC Davis at http://pmep.cce.cornell.edu/profiles/extoxnet/dienochlor-glyphosate/dimethoate-ext.html accessed on 28 October 2009.

examined in the valley. Thirty-four different pesticides were detected, ten more than the next highest site.  

Where streams once meandered across flat land through complex riparian forests, trees have since been removed and the land drained to increase cropland. Figure 6 provides a closer comparison of past to present. The northwest corner of the photo includes some of the Pudding River floodplain, which was described in the 1851 surveyor notes as “Timbered principally with Fir which has a very thick undergrowth of Hazel, Alder, Vine Maple and Fern.” The primary route from Salem to Silverton, Silverton Road, now runs through the lowland area that was avoided earlier by both trails and settlers’ roads.

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Figure 6: 1851 Conditions Compared to 2005 Aerial Photo

The channelized streams appear on the aerial photo as barely visible thin lines between large expanses of cultivated fields (see sections 16, 19, 21, 22, 26, and 34). Note the sizeable beaver pond that was described by surveyors. It is now gone, and this portion of Beaver Creek is a thin waterway between two grass seed fields, lacking riparian vegetation and associated wetlands. The highlighted northwest section compares the complex floodplain forest, where no roads or trails existed in 1851, to the drained farmland of today, with Silverton Road running through the middle. The thin yellow line is the path taken in 2008 to retrace the surveyors’ steps and notes.
Farmers often straighten smaller creeks to conform to squared-off fields and the ownership pattern created by the survey. Even so, for many years these streams were lined with willows, red-osier dogwood, reeds and rushes serving as a nutrient input to the water and as cover to small mammals and birds. However, as modern farming makes greater use of machinery and chemical treatments, most of these waterways have lost their streamside vegetation or are bordered by brambles of invasive blackberries, Scot’s broom, and reed canary grass. The riparian trees, shrubs, and forbs that were common just over a century ago provided vital functions for the health of streams, but a field survey today reveals most have become ditches with denuded mud banks. A 2008 study of watershed conditions in the Pudding River basin found that, generally, “streams with smaller amounts of tree cover had the highest grass/agricultural cover, and vice-versa. Many of the stream reaches examined had a ‘ditched and dammed’ pattern, where the stream was either flowing in a channelized ditch or was backed up by some sort of dam.” The study further recommends “restoring these channelized stream segments to more natural meandering systems” to improve watershed health and water quality.

In an attempt to see the land in 2008 as the surveyors saw it in 1851, and to determine if any of the original survey marks still existed, my husband Frank Mauldin and I walked the line between sections twenty-seven and twenty-eight following the survey notes (shown as yellow line in Figure 5). Frank guided our path using his

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308 Ibid.
survey skills from work performed during his college years. We could clearly see the “spring branch” encountered by the surveyors in what is now a cow pasture. We sighted from the spring northward and measured our path along the north-south line through a monoculture grass seed field. We came to the point of the first Territorial Road crossing and could detect the natural path of the old road heading up and down slope from that location. As we continued north, we left the field and entered an area currently managed for wildlife habitat. The first part was a brushy hillslope with a combination of native shrubs, invasive Himalaya and evergreen blackberries, Scot’s broom and a few wild pear and wild apple trees. The brambles were too thick to stay on the line, but we were able to pick it up again near the stream crossing. The course bearing and width of the stream essentially matched the 1851 description. A Douglas fir forest with undergrowth primarily of vine maple, hazel, fern, and native blackberry bordered the stream much like they would have observed.

On the opposite side of the stream, we located the approximate site of the quarter section point in a mass of vine maple and blackberry brambles, but saw no remnant of a post. We did, however, locate one of the white oak ‘witness trees’ whose bearings from this spot had been recorded. The tree bore a substantial and unusual bulge on one side indicating a re-growth of bark to cover the wound made by their markings. As we ascended the slope, we left the wildlife area and entered another grass seed field. We

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309 According to the Oregon Department of Agriculture (ODA), Himalaya blackberry is a noxious weed that was first noted in Marion County in 1922. From ODA website: [http://www.oregon.gov/ODA/PLANT/WEEDS/profile_himalayanblackberry.shtml](http://www.oregon.gov/ODA/PLANT/WEEDS/profile_himalayanblackberry.shtml) visited 3/25/2008. The evergreen blackberry was imported from Eurasia as a commercial crop, date unknown.
could barely make out where the road might have traveled before and after intersecting this line. We were stopped from reaching the section corner by a multi-strand electric fence enclosing a sheep pasture. Though we could not reach the point from which to see R.C. Geer’s house, as described in the notes, the house is still standing and is listed on the National Register of Historic Places.310

Figure 7 on the following page shows a present-day scene from the porch of the historic Ralph Geer house, capturing a view that may appear relatively unchanged from the mid-nineteenth century. Homer Davenport was raised here. During a visit from New York at the height of his career, he penciled a picture and note on the side of the house, which is preserved to this today (shown in Figure 7). The drawing depicts Davenport kneeling and weeping. This is what he wrote:

I want to say that from this old porch I see my favorite view of all that the earth affords. It was the favorite view of my dear mother and her parents and of my father, and why shouldn’t it be the same to me. It’s where my happiest hours have been spent.

Homer Davenport Apr 11, 1904

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310 Jim and Erika Toler, descendents of R.C. Geer, conversation with author on 16 February 2008. The house that exists now was built in 1851 and is listed on the national register of historic places at: http://www.nationalregisterofhistoricplaces.com/OR/Marion/state.html. The Toler’s have a portion of the Gunter chain used by T.W. Davenport.
Figure 7: Homer Davenport Drawing and View from Historic Geer House
Why tell the story of transforming an ecologically rich landscape into one that has become ecologically poor, producing monoculture farm and forest products for a global economy? What is the role of historians in drawing the link between ecological and cultural history? Historians are generally not scientists. We do not explain why biodiversity is important and how we might restore it. But we can tell the story that brings the pieces together, so that we do not lose this rich past. The next generations may want to know what was here before and how it came to be the way we know it now. These stories become the roots for the future, for, much like the loss of deep rooted prairie plants, the native peoples’ oral history told on the cold dark days of winter around the plank house hearth are missing. Our re-weaving of history today may help re-grow roots to the land at a time when resource depletion, climate change, and species extinction demand our well considered attention.
EPILOGUE

We can hope for the best for I see the signs of men.
From Euclid, *Opera omnia* (1703), frontispiece.\(^{311}\)

The “signs of men” are clearly visible across the planet today, as seen in satellite photos from outer space or looking up at contrails in the sky. The signs mark the extensive reach of modern human existence. Across much of the North American continent, the signs mark Jefferson’s classical and rationalist thought in the highly recognizable square patterns etched on the land. Yet, this phenomenon is recent considering the long span of human occupation on this continent.

It was just one hundred and fifty-seven years ago when the Santiam band of the Kalapuya expressed concerns while attempting to negotiate a reservation on a mere remnant of their former lands — those which lie between two forks of the Santiam River. The two chiefs, Al-que-ma and Ti-a-can, wanted the newly arrived white settlers to move from that land before they would sign a treaty. They explained that living alongside settlers did not work. The whites built fences, cut down trees, and let their hogs run free to root out camas bulbs. The Kalapuya did not want to move; they wanted the freedom to use their land in the traditional way. Ti-a-can explained “their

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\(^{311}\) Quote taken from J.L. Heilbron, *Geometry Civilized: History, Culture, and Technique* (Oxford: Clarendon Press, 1998), frontispiece caption to Fig. 0.0.1 entitled “Geometry as evidence of civilization.” The inscription on the painting reads: “Aristippus the Socratic philosopher being shipwrecked in Rhodes noticed some diagrams drawn on the beach and said to his companions, ‘We can hope for the best for I see the signs of men.’”
hearts were upon that piece of land, and they did not wish to leave it.”\textsuperscript{312} Al que ma was adamant: “We wish to reserve this piece of land (placing his finger on the map). We do not wish to leave this, we would rather be shot on it than to remove.”\textsuperscript{313}

The Kalapuya were allowed to stay, but the settlers were not asked to move. Instead, the chiefs were offered plows and farming utensils, which they refused. They were offered education but turned it down. It was clear the Kalapuya and the white settlers could not live side-by-side, and a treaty was signed in 1857 that initiated their removal to the Grand Ronde reservation.\textsuperscript{314} The transition was difficult for the Kalapuya and all those from various Oregon tribes that were thrown together on one reservation, in part from losing access to their traditional foods and forced to eat the unfamiliar food of the white settlers. Eventually they realized they would not survive without adopting the new ways, which included farming. In this process of ‘rehabitation,’ they came together as one: The Confederated Tribes of the Grand Ronde.

The Americans, on the other hand, were busy occupying the land and imposing their own cultural belief system upon it. They were not so dependent on the land’s ecological health, as on its potential to be cultivated and exploited. Their needs were limited to the underlying climate, soil, water, and wood with limited reliance on wild game, fish, and berries and no interest in camas or tarweed. Their primary idea of

\textsuperscript{312} Mackey, \textit{The Kalapuyans: A Source Book on the Indians of the Willamette Valley}, 103.

\textsuperscript{313} Ibid., 107-108.

nature’s bounty was how well it could support their imported species and their idea of a civilized way of life. For the most part, the land in its uncultivated state did not carry a spiritual, communal, or ancestral meaning for them, as it did for the Indians. To most settlers, nature was but a canvas on which they could paint their conception of an improved landscape derived in part from the European pastoral. Jefferson’s grid was instrumental in dividing up the new space and framing substantial portions on which the yeoman farms could take shape.

Over time, with the rise of the industrial age, Jefferson’s expectations for building a nation of yeoman farmers could not hold. Consider the 1921 autobiography of American naturalist and author John Burroughs (1837-1921). He recollected the days when farmers labored with “the scythe and the good mower.”

With the modern agricultural machinery the same crops are gathered now with less than half the outlay of human energy, but the type of farmer seems to have deteriorated in about the same proportion. The third generation of farmers in my native town are much like the third steeping of tea, or the third crop of corn where no fertilizers have been used. The large, picturesque, and original characters who improved the farms and paid for them are about all gone . . .

The farms keep more stock and yield better crops, owing to the amount of imported grain consumed upon them, but the families have dwindled or gone out entirely, and the social and the neighbourhood spirit is not the same. No more husking or quiltings, or apple cuts, or raising or “bees” of any sort. The telephone and the rural free delivery have come and the automobile and the daily newspaper. The roads are better, communication quicker, and the houses and barns more showy, but the men and the women, and especially the children, are not there. The towns and the cities are now colouring and dominating the country which they have depleted of its men, and the rural districts are becoming a faded replica of town life.  

In Burroughs’ thoughts are the faded imaginings of Jefferson — his desire that the United States be built upon the high character of yeoman farmers industriously and judiciously working the land and civilizing the far-flung territories. Although Burroughs was describing his homeland in New York’s Catskill Mountains, his sentiments capture developments in Oregon as well. In the ensuing eight decades, modernization and the urban culture significantly altered the rural landscape to such a degree that Burroughs might find only small fragments of such worlds today as his naturalist’s eyes had examined a century ago.

This thesis does not describe a decline, however, from an uninhabited pristine wilderness. Rather, it is a decline from a landscape in which the native people operated within natural constraints, while working to maintain relatively stable vegetative conditions. The study of the ecological past of the Waldo Hills past does not indicate the region’s ecosystems were constantly changing, reflecting a nature constantly in flux on a human timescale. Such a system would leave little for the native people to depend upon from season to season and from year to year. Their longstanding successful inhabitance indicates that resources remained relatively stable. Their practice of burning did not influence all parts of the landscape. Forested floodplains and ravines were largely left to natural processes that one might conclude demonstrated Clements’ ecological succession after major disturbances (such as windfall) to climax vegetative states until new disturbances restarted the process, or other major disturbances altered underlying conditions (e.g., climate change).
The transformation from a diverse ecological state to a largely monoculture landscape — a technological artifact of modern Western civilization — did not gradually take shape over time with increasing human occupancy and use of modern technology. It occurred as a substantial shift when people embodying the American worldview displaced the indigenous peoples’ traditional ecological knowledge and reverence for nature and its spirits. Humans are within nature not simply by virtue of being human, as some postmodern deconstructionists claim, but by virtue of their worldviews that set them either ‘within’ or ‘outside’ the more natural and functional ecosystems.

On the other side of the planet in the early 20th century, Russian geologist and biochemist Vladimir Vernadsky (1863-1945) was developing concepts that are relevant to understanding the environmental changes in Oregon and the meaning of functional ecosystems. He termed these conceptions biosphere and noosphere. Vernadsky’s ideas were a radical departure from the reductionist views held by most scientists of his time. Rather than reducing the world into parts that can more easily be studied, Vernadsky sought to draw connections — to define the natural world as an interrelated whole.316 The biosphere, as he defined it, encompasses all areas of the Earth where life exists. Considering microbiological activity, this area extends from deep in the Earth’s crust to the upper atmosphere. By studying the effects of

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316 Vernadsky was far from alone in this kind of thought, as the earlier work of Alexander von Humboldt, *Cosmos* (1860) and George Perkins Marsh, *Man and Nature* (1864) also examined earth systems in a holistic manner. However, by the early twentieth century, scientists were becoming far more specialized and reductive in their quantitative approaches to explaining the natural world.
microorganisms on the physical and chemical elements of their environment, he
determined that life acts as a geologic force. Life forms are essential for breaking
down rock, transporting minerals, and cycling nutrients needed for life. They help
maintain the homeostatic chemical balance in the atmosphere that supports life. In
essence, he postulated that biological organisms, through interactions in complex
biogeochemical cycles, are active agents in maintaining conditions necessary for life.
Thus, a functional ecosystem is one in which biospheric processes are successfully
operating. Writing near the end of his life in the 1940s, Vernadsky warned:

In the 20th century, for the first time in history, Man knew and embraced the
biosphere, completed the geographical map of the Earth, and settled all over its
surface. Mankind has become a single entity in its life. There is not a single
corner of the Earth where Man could not survive if necessary. . . The whole of
mankind comprises an insignificant mass compared to total planetary matter.
[However] mankind’s power is connected not with its matter but with its
brains, its thoughts and its work guided by its mind. In the geological history
of the biosphere, a great future is opened to Man if he realizes it and does not
direct his mind and work to self-destruction.317

Vernadsky described the power of humankind’s intelligence as a new force upon
the Earth, which he termed the noosphere. He regarded humanity’s influence as
starting with the “geographical map” then settling all over the Earth’s surface. The
rational human mind born of the seventeenth century masters who gave us the
Scientific Revolution, and the eighteenth century philosophers who brought science,
rationality, and social concerns together in the Enlightenment, became the dominant
intellect reflected on the land. The noosphere of this worldview began taking shape in

317 From Vladimir Vernadsky, Geochemistry and the Biosphere: Essays by Vladimir I.
Vernadsky edited by Frank B. Salisbury (Santa Fe: Synergistic Press, 2007), 413-414.
early America as Jefferson’s classicist-inspired survey grid. The intelligence of the Western mind has since spread itself across the agricultural landscape of the Waldo Hills’ township, which an aerial view today clearly depicts as both ‘gridded’ and ‘monocultured’. By contrast, the largely pre-settlement view depicted in the hand-drawn 1851 map reflects the conditions of a healthy biosphere before the noosphere took shape; i.e., the biosphere dominated the terrain and the mark of humanity did not reflect a highly rational and technological influence.

Thoreau’s writing in 1856 on “An Emasculated Country” bears on the problem.

March 23: The whole civilized country is to some extent turned into a city, and I am that citizen whom I pity. Many of those animal migrations and other phenomena by which the Indians marked the season are no longer to be observed. I seek acquaintance with Nature—to know her moods and manners. Primitive Nature is the most interesting to me. I take infinite pains to know all the phenomena of the spring, for instance, thinking that I have here the entire poem, and then, to my chagrin, I hear that it is but an imperfect copy that I possess and have read, that my ancestors have torn out many of the first leaves, and grandest passage, and mutilated it in many places. I should not like to think that some demigod had come before me and picked out some of the best of the stars. I wish to know an entire heaven and an entire earth. All the great trees and beasts, fishes and fowl are gone. The streams, perchance are somewhat shrunk.\(^{318}\)

Is this not what was found in the diminished hill country of western Oregon? The change occurred as a shift from biosphere to noosphere, with the noosphere reflecting the American worldview. This view largely regarded nature as an object, to be studied, admired, and exploited for human advance. The “I-Thou” of the Indians became the “I-It” of the Euroamericans. The belief that nature exists “out there” and can be

dominated by human intelligence and ingenuity drove behavior that kindled a lack of humility — an estrangement from the natural world and, subsequently, from the consequences of human actions. Therefore, humans generally came to believe that any harmful consequences that occur can be ‘fixed’ through greater ingenuity, which usually takes the form of new technology. Such thinking was not restricted to capitalist societies; communist countries operating under the theme of dialectical materialism also succumbed to these ideals.319

Understanding that the fundamental beliefs of a society become expressed in physical conditions may benefit those working to create sustainable futures. There is merit in the argument that changing the physical conditions to improve the state of the environment can only begin with a substantial shift in worldview. Otherwise, environmental improvements face a continual challenge from the predominance of thought that, for example, near term economic well-being trumps ecological initiatives, regardless of the eventual harm to economies from a degraded biosphere.

American lifestyles are far from the naturally synchronistic lifestyle of the Kalapuya. Any move toward a synchronous relationship with the land today must rely in part on the science we know, while accepting that the inevitable complexity in the natural world means some aspect may always remain beyond our intellectual grasp. Perhaps the ‘chains’ placed upon the land will fall away and be replaced by a conscious commitment and care to treat it as something much greater than our human systems can reproduce. Perhaps we will surrender ourselves to its well-being with the

full knowledge that our own well-being is ultimately bound up with it. The historical record clearly demonstrates that our collective intent will be reflected across the landscape. We have read the chapters that recorded the transformation from the eighteenth to the twenty-first century. The next chapter has yet to be written.
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