

## KEYNOTE ADDRESS

### Thinking Like a Mountain in 2009<sup>1</sup>

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In 1974, Susan Flader<sup>4</sup> chronicled, in biographical form, the development of Aldo Leopold's thinking about land and the human role in its dynamic. She titled her book Thinking Like a Mountain after Leopold's milestone essay of the same name and one of three alternate titles considered by him for his classic, A Sand County Almanac<sup>5</sup>. Her treatise was the opening shot in what has become a continuing barrage of books and papers, ranging from the highly scholarly to the purely emotional, on Leopold's thinking and writing, the centerpiece of which was A Sand County Almanac, cornerstone for and bible of the environmental movement.

Flader's opening paragraph immediately gave notice to the reader that "Thinking Like a Mountain," the essay, was a reflection spanning 35 years of learning from well intended but sometimes false assumptions, the birth and infancy of the science of ecology, conflicts between preservationism and utilitarianism ranging from chronic simmering to rage, politics and policies skewed by personal gain agendas, and the culminating conclusion that land ethics would be an extension of and as critically important to civilization as were social ethics.

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<sup>4</sup> Flader, S.L. 1974. Thinking Like a Mountain. Univ. of Nebraska Press, Lincoln, NE. 284 p.

<sup>5</sup> Leopold, A. 1949. A Sand County Almanac and Sketches Here and There. Oxford Univ. Press. New York, NY. 224 p.

To Leopold, thinking like a mountain was, in effect, to ponder the deep philosophical questions:

What is the nature of the world we live in?

What does it mean to be human?

What is an appropriate relationship between humans and nature, i.e., the ecosystems upon which we depend?

Leopold himself had not always thought this deeply. As a green, young forester, 22 years old, fresh out of Yale, imbued with Gifford Pinchot's "wise use" policy for the American forest and Teddy Roosevelt's perspective on large predators, and undoubtedly an eagerness to be integrated into southwestern culture, he enthusiastically sought to eradicate a species that would later become his "numen"<sup>6</sup> of the southwestern mountains – the wolf.

The seminal event that would sometimes be incorrectly referred to as Leopold's "Road to Damascus Experience"<sup>7</sup> took place on the Apache National Forest in Arizona in 1909. He and a co-worker had attempted to kill a wolf and her pups. They succeeded in killing the old wolf and critically wounding at least one of the pups – an achievement in itself, although not as great as it might have been according to the values of the day.

It was also at this time that Leopold saw something he likely had never seen before, the expression of defiance in a wild canid's eyes as it struggled to defend itself in the face of inevitable death. Many years later, that one wolf would come to represent a species of large predators at the top of the food pyramid and performing a function critical to ecosystem stability, i. e., large herbivore population suppression. In

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<sup>6</sup> This word is a misconstruction of the word "numen," meaning, according to The American Heritage Dictionary, a spirit believed to inhabit certain natural phenomena or objects.

<sup>7</sup> According to Christian religion tradition, the event in which Saul of Tarsus, a tireless persecutor of the early Christians, is converted to Christianity, and becomes the Apostle Paul, one of the most important foundation members in the Christian religion.

addition, the “fierce green fire” he claimed to have seen dying in the eyes of the wolf, would come to represent the loss of wildness and the eradication of wilderness on the American landscape.

But Leopold’s conversion was anything but immediate (Flader 1974, Meine 1988<sup>8</sup>). Even nine years later at the Sixth American Game Conference in New York, he proclaimed the importance of the ultimate goal of large predator eradication in the Southwest (Meine 1988:181; also see p.169)). The penning of his earliest penetrating essay on wilderness, “The River of the Mother of God,” was still 15 years away (Flader and Callicott (eds) 1991:123-127)<sup>9</sup>.

In the context of Leopoldian thinking, *thinking like a mountain* is the process of intellectual development as one returns to recurrent subjects and reconsiders them in the light of new information, a changing social, political, and economic environment as well as a changing biosphere, and changing human values. *Thinking like a mountain* sees the ecosystem dynamic (the movement of energy, nutrients and genetic material across space and time) as the engine of evolution. *Thinking like a mountain* sees geological process as the shaping of the abiotic environment thus the changing matrix for life on the planet and the natural determinant of life forms, distribution and abundance. *Thinking like a mountain* sees the human species as ecosystem component and human activity as ecological process. *Thinking like a mountain* organizes lessons from evolution and ecological process into a calculus for evaluation of what it means to be human and the wisdom of human choices of roles that have been and might be played in the ecosystem dynamic.

Leopold began to describe what he meant by “thinking like a mountain” when in his essay, following descriptions of various reactions upon hearing the call of a wolf in the night, he wrote:

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<sup>8</sup> Meine, C. 1988. Aldo Leopold: His Life and Work. The Univ. of Wisconsin Press. 638 p.

<sup>9</sup> Flader, S. L. and J. B. Callicott (eds). 1991. The River of The Mother of God. The Univ. of Wisconsin Press. 384 p.

**“Yet behind these obvious and immediate hopes and fears there lies a deeper meaning, known only to the mountain itself. Only the mountain has lived long enough to listen objectively to the howl of a wolf.”**

**He did not imply that the mountain had an intellectual capacity, instead he saw it as the stage created by geological process and upon which the ecosystem dynamic driving evolution had been played out. If the mountain could talk, it could bear witness to ecological successes and failures in functioning and derivation of the functional importance of the various ecosystem components.**

**He continued this perspective in the essay “Escudilla” when he wrote:**

**“Since the beginning, time had gnawed at the basaltic hulk of Escudilla, wasting, waiting, and building [geological process]. Time built three things on the old mountain, a venerable aspect, a community of minor animals and plants, and a grizzly [evolution of the biotic community].**

**“The government trapper who took the grizzly had made Escudilla safe for cows. He did not know he had toppled the spire off an edifice a-building since the morning stars sang together [removal of a critically important functional component from the ecosystem – a large predator; truncation of the food pyramid].”**

**In “Song of the Gavilan,” Leopold petitioned the reader to “think like a mountain” when he, in soft, courting manner, wrote:**

**“Then on a still night, when the campfire is low and Pleiades have climbed over rimrocks, sit quietly and listen for a wolf to howl, and think hard of everything you have seen and tried to understand. Then**

**you may hear it – a vast pulsing harmony – its score inscribed on a thousand hills [ the geological record], its notes the lives and deaths of plants and animals [the ecosystem dynamic], its rhythms spanning the seconds and the centuries [ multiple time scales for the ecosystem dynamic and evolution].”**

**Then setting the human species into the “perspective of the mountain” in “On a Monument to the Pigeon,” he wrote:**

**“..... We know now what was unknown to all the preceding caravan of generations: that men are only fellow voyagers with other creatures in the odyssey of evolution.**

**“Above all we should, in this century since Darwin, have come to know, that man, while now captain of the adventuring ship, is hardly the sole object of its quest .....**”

**In the same essay, Leopold proclaimed his optimism for the human capacity to think like a mountain in the closing paragraph:**

**“To love what *was* is a new thing under the sun, unknown to most people and to all pigeons. To see America as history, to conceive of destiny as a becoming, to smell a hickory tree through the still lapse of the ages – all these things are possible for us, and to achieve them takes only the free sky, and the will to ply our wings. In these things, and not in Mr. [Vannevar] Bush’s bombs and Mr. DuPont’s nylons, lies objective evidence of our superiority over the beasts.”**

**Of all the millions of species that currently exist or that have ever existed, only *we* have the ability to think like a mountain. With this magnificent ability comes an awesome responsibility.**

And finally, in “The A-B Cleavage” section of “The Land Ethic,” capstone essay to A Sand County Almanac, Leopold separates those unlikely to “ply their wings” to think like a mountain from those who might do so:

“Conservationists are notorious for their dissensions. Superficially these seem to add up to mere confusion, but a more careful scrutiny reveals a single plane of cleavage common to many specialized fields. In each group (A) regards the land as soil, and its function as commodity-production; another group (B) regards the land as a biota, and its function as something broader. How much broader is admittedly in a state of doubt and confusion.”

Then in the concluding paragraphs of this prophesy written for the modern world and human hopes, fears and plans for its future, Leopold made a final petition for conservationists to avoid a sense of superior piety and becoming enamored with self-derived motives, and instead, to think like a mountain:

“The evolution of a land ethic is an intellectual as well as an emotional process. Conservation is paved with good intentions which prove to be futile, or even dangerous, because they are devoid of critical understanding of either land, or of economic land use.”

The development of “thinking like a mountain” is an evolutionary process for the individual as well as the collective human community. To even begin the process requires a striving for intellectual humility. It requires us to see ourselves as *a part* of something in contrast to being *the part* of something, a process requiring a humility that is not only counter to natural human tendencies, but also to Judeo-Christian and Islamic traditions.

**The process requires an insatiable desire to understand the principles of the world we live in while acknowledging that a complete understanding will never be attained by either an individual or by the collective science of the human community. The human community must constantly strive to discover, understand and apply ecological principles as scriptural guidance for our roles in the ecosystem dynamic, i.e., the differentiation between right and wrong behaviors. We must constantly review the lessons that those things that are right tend to stabilize our relationship with the rest of the ecosystem and therefore do not jeopardize the future of our progeny by degrading the ecosystems upon which we and they will depend.**

**The evolution of thinking like a mountain results in the extinction of dogmas, the subjectively derived proclamations about what the land is, what it is for, and how humans should function in our heterotrophic dependence on it. The evolutionary development of thinking like a mountain is a continuum of growth in the mutuality of love and respect for the land and knowledge of it. As we learn to think like a mountain, we increasingly understand that we can not love something we do not respect, and we will not respect something we do not love. Our love of the land will drive our desire to treat it with respect, and our accumulating knowledge of ecology will teach us how to treat it with respect as we consume portions of its components. But to do these things, we must ply our intellectual as well as our emotional wings.**

**Finally, in our individual odysseys of learning to think like a mountain, we must accept our individual and collective humanness. Thinking by the best of humans will at some point become constrained by ego, a sense of self-preservation, a resistance to changing knowledge, a reluctance to admit to mistakes, a desire to hold on to the part of the past that was particularly good for them, and a reluctance to objectively consider differing visions and ideas for the future of the land. Furthermore, concomitant with being human is the brevity of the individual human experience relative to the time scales**

appropriate to the changing abiotic environment and the biotic community embedded in it (i.e., the ecosystem). Something that is “forever” is a human concept or possibly a hope. So far, there is nothing in the geological or astrophysical records suggesting that the *forever* phenomenon ever has been a characteristic of nature.

What are the implications and petitions of a treatise entitled “Thinking Like a Mountain in 2009?” Leopold has given us guidance in the essay “The Round River – A Parable.”<sup>10</sup> He used American mythology of Paul Bunyan’s modification of a stream to create a “round river” that transported logs from the harvest site to a distant mill and returned the rivermen and supplies to the harvest site to begin the process again. The stream was the ecosystem and its flow was the ecosystem dynamic. The logs and other materials were the energy, nutrients, and genetic materials in the ecosystem dynamic. Paul’s channeling of this stream represented human efforts to modify and guide the ecosystem dynamic in a manner most beneficial to us. Leopold pictured humans as ecosystem component and human activity as ecological process as follows:

“We of the genus *Homo* ride the logs that float down the Round River, and by a little judicious ‘burling’ we have learned to guide their direction and speed. This feat entitles us to the appellation *sapiens* [the thinker]. The technique of burling is called economics, the remembering of old routes is called history, the selection of new ones is called statesmanship, the conversation about oncoming riffles and rapids is called politics. Some of the crew aspire to burl not only their own logs, but the whole flotilla as well.”

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<sup>10</sup> Leopold, L. B. 1953. Round River: From The Journals of Aldo Leopold. Oxford Univ. Press. New York, NY. 173 p.

**“.... To learn the hydrology of the biotic stream [the ecosystem] we must learn to think at right angles to evolution and examine the collective behavior of biotic materials [the ecosystem dynamic]. This calls for a reversal of specialization; instead of learning more and more about less and less, we must learn more and more about the whole biotic landscape.**

**“.... Ecology is destined to become the lore of Round River, a belated attempt to convert our collective knowledge of biotic materials [ecosystem processes] into a collective wisdom of biotic navigation [land management].”**

**Thinking like a mountain requires us to see South Carolina as Leopold saw Wisconsin in his essay:**

**“Wisconsin not only *had* a round river, Wisconsin *is* one.”**

**Leopold’s pragmatism was clear in this essay when he wrote:**

**“We have radically modified the biotic stream; we had to.”**

**That is, once the idea of civilization was in place, it would take agriculture and eventually commercial forestry to provide for its progress. We farm, practice forestry, and fish to feed, clothe and shelter the human community. We have no choice in this matter. However, we do have choices in *how* we do it.**

**What lines of reasoning guide our reactions to the land, thus our values for it? Of course, our values for the land are shaped by many forces as are our values for anything. But how conscious are we of these forces? Are we truly motivated to objectively think and rethink why we choose to treat the land as we do?**

Answers to these questions can be derived only through serious efforts at deep introspection – a difficult task for all humans. As uncomfortable as we often become with our perceptions of the values and motivations of others, we are typically content with our own, even when we, at least at some level, confess that we are all subject to biases formed from personal ambition, the influences of others we wish to please, and personal life experiences. But if we are to objectively seek what is best for the land, i.e. the sustainability and enhancement of the ecological integrity and aesthetic qualities of these ecosystems upon which we depend, we must individually and collectively step outside of ourselves and look deeply into the inside of who we are and why. This is a truly difficult intellectual exercise in comparison to self-evaluations based on tradition, emotion, and other personal biases with which we have become comfortable.

We must look at the full sweep of values for the land ranging from possibilities for immediate and long-range economic returns through ecosystem services to the aesthetic qualities of physical beauty, the opportunities for solitude (i.e., the wilderness experience) and perceptions of the full ecological dynamic (i.e., Leopold’s “vast pulsing harmony”). Individuals, organizations and agencies must constantly assess changes in the state of the land, changes in our knowledge of the land, and changes in society’s values for the land.

In my opinion, in the early 1990’s, the USDA-Forest Service articulated a slogan that should guide all land managers, both public and private – “Caring for the land and serving people.” A few years later, Chief Jack Ward Thomas<sup>11</sup>, describing the fundamental responsibility of Forest Service employees, described American citizens as “our owners [of the National Forest System] and our clients.” American society expects all of us as managers, scientists and teachers to accept this role in service to individual landowners as well as the larger community, and to play it out

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<sup>11</sup> Dr. Thomas is a holder of The Wildlife Society’s Aldo Leopold Medal, the organization’s highest level of recognition, and a Leopold scholar.

**with the utmost dedication and commitment and professional and personal integrity.**

**Can we become unified in this most fundamental of purposes? Can we emulate the highest efforts of the theoretical physicists who struggle to discover the holy grail of physics – a unifying theory, the theory that bridges the discontinuity between quantum mechanics and Newtonian physics? For us the unifying purpose is the future of the land. For us the holy grail of knowledge is how to assess the changing dynamics of the land including the human roles in those dynamics.**

**To pursue this struggle, we must in individual and organizational relationships quit keeping each other at arm's length. This is an utter waste of energy and intellect. It is a disservice to the society we profess to serve; a failure in our responsibilities to progress in society and the advancement of civilization.**

**As Leopold predicted, over specialization has led to narrow, compartmentalized thinking that is counter-productive to unification in purpose and understanding. Conservation biologists must come to understand that the land is fragmented both ecologically and economically and that private property rights are critical to a democratic and capitalistic system and the human freedoms inherent to it. In the real world, humans are ecosystem components and human activity is ecological process. Industrial forestry and those who must attend to its economics must quit thinking of land *purely* in an economic context. America has a higher and wider gamut of expectations. Our failures to adequately address those expectations in the past has led to dramatic changes in the American forest products industry over the past 20 years. Some of these changes may prove to have been mistakes in the future, but the citizens in a democratic and capitalistic system have the freedom to make such mistakes. And they are prone to doing so when they become frustrated with the professions which profess to serve them, fail to lead and educate them.**

**It is a universal principle that every generation has and always will face new challenges. As land managers, scientists, and teachers, or collectively – conservationists, we face the challenges of changing ecosystems, changing knowledge of ecosystems , and changing human values for ecosystems. Our pivotal role in society is to be the fulcrum for balance in decisions about how society will pursue the future for the land, and thus its own future as we are inextricably a part of and dependent upon it. I beg you today and in the context of this meeting, consider Leopold’s proclamation to Wisconsinites using the metaphor of the Round River – “Wisconsin not only *had* a round river; Wisconsin *is* one.”**

**This land called South Carolina is a round river, and *it flows through us.***

**And finally, paraphrasing Leopold<sup>12</sup>, let us ponder the following: *Can we see South Carolina as history, conceive of destiny as a becoming, smell a hickory tree through the still lapse of the ages? All these things are possible for us, and to achieve them takes only the free sky, and the will to ply our wings.***

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<sup>12</sup> From the last paragraph of “On a Monument to The Pigeon.”