

Aldo Leopold: In Search of a Poetic Science

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Abstract

In this article, I examine Aldo Leopold's experimentation in his Sand County Almanac with a form of poetic discourse that seeks to reimagine the nature of science — ultimately, which seeks the possibility of what might be called a "poetic science." I engage a set of interconnected themes which are central to this project of reinvisioning the enterprise of science: Leopold's radical questioning of the meaning of perception, of our experience of the "other," and of the dichotomy of "subjectivity" and "objectivity." Finally, I offer a reading of "The Song of the Gavilan," the Almanac essay in which Leopold makes his most extended comments about science.

Keywords: Aldo Leopold, Sand County Almanac, poetic discourse, science

Introduction

Aldo Leopold spent eight years writing his *Sand County Almanac*, and much of this time was devoted to the search for a literary style² that would enable him to meet the challenge of integrating the two expressed desires of his prospective publisher, Alfred A. Knopf. In 1941, Harold Strauss from Knopf invited Leopold to write a "nature book," which primarily would be "a personal book recounting adventures in the field, . . . warmly, evocatively, and vividly written, . . . a book for the layman." Strauss then added, perhaps as an afterthought, that the book might also leave some "room for the author's opinions on ecology and conservation . . . worked into a framework of actual field experience" (Ribbens 1987, 92f).³ Leopold was intrigued by the project of bringing these two ideas together — a "nature book" that was also a work of ecology; a personal narrative that was also a contribution to science.

His eventual solution to this double task was to initiate two moves that are among the most distinctive marks of the *Almanac*. On the one hand, he came to reconfigure nature observation according to an ecological sensibility, and on the other, to reconfigure scientific description according to a poetic sensibility. The focus of this article will be on the sec-

ond of these moves, Leopold's experimentation with a form of poetic discourse that seeks to reimagine the nature of science — ultimately, which seeks the possibility of what I will call a "poetic science."⁴

I will begin by briefly contextualizing this experimentation within the noiresque plot of Leopold's struggle with his publishers, then turn to say something about the overall form of *A Sand County Almanac*, before engaging a set of interconnected themes which together constitute the space within which he pursues his project of reinvisioning the enterprise of science: his radical questioning of the meaning of perception, of knowledge, of our experience of the "other," and of the slippery dichotomy of "subjectivity" and "objectivity." Finally, I will end with a reading of "The Song of the Gavilan," the *Almanac* essay in which Leopold makes his most extended comments about science.

Publishing Blues

Aldo Leopold's *A Sand County Almanac* has been called "the Holy Writ of American Conservation" (Dubos 1972, 156), and "the intellectual touchstone for the most far-reaching environmental movement in American history" (Nash 1989, 63). But getting the book published in the first place was an epic ordeal. Various versions of the manuscript were rejected by three publishers (Macmillan, Minnesota, and Knopf) over an eight-year period before Oxford finally accepted it in April of 1948 (Ribbens 1987, 91-109; Lorbiecki 1996, 165-179). Exactly a week later, Leopold died of a heart attack while fighting a fire at a neighbor's farm (Lorbiecki 1996, 178f). The book was published posthumously in 1949, with the title *A Sand County Almanac* supplied by the editors at Oxford (Leopold had considered *Marshland Elegy*, then *Thinking Like a Mountain*, and eventually submitted the manuscript as *Great Possessions*) (Ribbens 1987, 105; Lorbiecki 1996, 176).

Now why such hesitation on the part of the publishers? It's not that Leopold was an unknown author. In fact, he had published hundreds of articles on scientific and policy topics, as well as the classic text *Game Management*. He'd become a leading figure in the field of conservation ecology; been the Associate Director of the U.S. Forest Service's main research

institute; held the chair of wildlife management at the University of Wisconsin; and co-founded the Wilderness Society (1935) (Finch 1987, 227f; Nash 1989, 63ff). Not too shabby a resume, all in all.

After the original invitation from Knopf, Leopold worked three years on the manuscript, and submitted it both to Knopf and Macmillan in 1944. Macmillan rejected it outright, and Knopf demanded major changes. The essays seemed “so scattered in subject matter,” they wrote, and “the point of view and even the style varies from one essay to another,” so that “the average reader would be left somewhat uncertain as to what you propose.” Most significantly, the “nature book” (the “personal book recounting adventures in the field”) had been overwhelmed by the ecology: “I wonder if you would consider making a book purely of nature observations, with less emphasis on the ecological ideas which you have incorporated into your present manuscript? It seems to us that these ecological thoughts are very difficult indeed to present successfully for the layman” (Ribbens 1987, 99).

The University of Minnesota Press rejected the manuscript two years later, in 1946, on much the same grounds: Leopold should “introduce more of himself, so that his personal experience becomes the thread on which the essays are strung” (Ribbens 1987, 101). Then in 1947, after months of revision and the addition of several new essays, Leopold re-submitted his manuscript, *Great Possessions*, to Knopf in essentially the form we know as *A Sand County Almanac* today. He had worked hard to satisfy Knopf’s desire for a nature book (most of the new essays were personal vignettes about his experiences on his “sand farm”⁵ in Wisconsin), but also to hold on to the more ecological and philosophical dimensions of the writing, which he now felt he had integrated convincingly to form a unified whole — what J. Baird Callicott aptly calls a “literary ecosystem” (Callicott 1987a, 7). But Knopf remained displeased: the book “is far from being satisfactorily organized. ... The ecological argument everyone finds unconvincing; ... it is not tied up with the rest of the book” (Ribbens 1987, 102).⁶

Structure: A Disorienting Unity

Indeed, it cannot be denied that the book seems awkwardly fragmented. The *Sand County Almanac* proper only makes up the first seventy or so pages of the over-two-hundred page manuscript. This first part contains what Leopold called his “shack sketches,” short essays presented in a month-by-month, January through December format, recounting his explorations of the habitat of an abandoned 120 acre farm he’d bought in 1935 at the age of forty-eight along the Wisconsin River — described by Leopold’s biographer Marybeth Lorbiecki as it was when it was purchased as “a

chicken coop with a pile of manure at one end, a forlorn line of elms, bushels of sand blowing and dusting the snow, and a seemingly endless stretch of ruts” (Lorbiecki 1996, 133). All the main characters of these essays, apart from Leopold the narrator, are animals and plants: here we meet skunks and deer, muskrats, mink, rabbits, and wolves; hawks, owls, geese, chickadees, robins, warblers, pigeons, grouse, quail, woodcock, partridges and cranes; oak trees, pines and tamaracks; inhabitants of the forests, denizens of the bogs, and creatures of the prairies and marshes.

Stylistically, Leopold narrates his encounters in a highly literary form. His essays are really prose poems — he constructs what might be called a floral and faunal poetics. In short, we are presented with a radically different language from that of the hundreds of articles that had made Leopold famous to the world of conservation science and policy.

Following the *Almanac* proper comes Part II, the “Sketches Here and There,” which is organized not temporally, like the month-by-month almanac of Part I, but spatially, recording some of Leopold’s experiences over a forty year period during his travels in Wisconsin, Illinois, and Iowa; Arizona and New Mexico; Oregon and Utah; Northern Mexico and Manitoba. The sketches, like the *Sand County Almanac* itself, continue in a poetical form. But there is also a fundamental discontinuity, a marked shift of tone: in the *Almanac* essays of Part I, even when Leopold pauses to express sorrow over the decline or loss of a habitat or species, generally he does so with a light touch, so that loss is muted, counterpoised with the continuing sense of marvel and joy at the wonders of nature.

But in the “Sketches” of Part II, the tone of celebration is replaced with one of mourning: the sketches are dirges, requiems, elegies, filled with bereavement and melancholy. It’s as though the light-hearted essays of the *Almanac* were rewritten, translated, by a dark poet. Listen to the opening of the first essay of the *Almanac*, “January Thaw”:

Each year, after the midwinter blizzards, there comes a night of thaw when the tinkle of dripping water is heard in the land. It brings strange stirrings The hibernating skunk, curled up in his deep den, uncurls himself and ventures forth to prowl the wet world, dragging his belly in the snow (Leopold 1987, 3).

This is a time of beginning, of thaw, of rebirth from hibernation; it is a world of stirring and uncurling and tinkling. Now listen to the opening lines of the first “Sketch,” “Marshland Elegy”:

A dawn wind stirs on the great marsh. With almost imperceptible slowness it rolls a bank of fog across

*the wide morass. Like the white ghost of a glacier
the mists advance, riding over phalanxes of tamarack,
sliding across bog-meadows heavy with dew.
A single silence hangs from horizon to horizon*
(Leopold 1987, 95).

The landscape has become apparitional, pale, slow, heavy, cloaked in an uncanny silence and permeated with a sense of foreboding.

Finally, Part III completely breaks with the poetical style of Parts I and II,⁷ and consists of a set of four more extended essays, discursive and analytical in tone, on aesthetic, ethical, and policy issues surrounding wilderness conservation (“Conservation Esthetic,” “Wildlife in American Culture,” “Wilderness,” and “The Land Ethic”). As Leopold himself puts it in his Foreword, almost with a sense of embarrassment, Part III “sets forth, in more logical terms,” his thoughts about nature and conservation. He adds: “only the very sympathetic reader will wish to wrestle” with these final essays (Leopold 1987, viii). Thus we have yet another translation, now of his poetics (both the light poetics of the *Almanac* and the dark poetics of the “Sketches”) into “logical terms” — as though Leopold felt the need to decode the enigmatic language of poetry, to decipher the mysterious text of the poem into the recognizable phrasing of analysis.

So it’s an odd book: fragmented, perpetually shifting in style and tone, undergoing a series of translations that effect a confusion of voices. Perhaps we shouldn’t be too hard on all those publishing houses that declined to accept it. Indeed, almost nobody read the book until the 1960s, with the emergence of the environmental movement.

Shifts: Towards a Poetic Science

The publishers notwithstanding, the odd structure of the text — its shifting styles and tones, its unsettling pattern of self-translation and self-transfiguration — is in fact central to Leopold’s project of developing a style which would mirror his vision of a transgressive integration of science and poetics. This disorienting style beautifully reflects one of Leopold’s central purposes: to explore different ways of seeing, different ways of knowing. He says in his Foreword that “one must make shift with things as they are. These essays are my shifts” (Leopold 1987, vii). These essays, indeed, are experiments in shifting focus, altering vision, changing perspective; attempts to see things from as many different angles as possible; a kind of seeing like what Nietzsche called *Winkelübersehen*, seeing around corners, or looking into the nooks of things. Leopold says in an essay on the Clandeboye marsh in Manitoba that “education, I fear, is learning to see one thing by going blind to another” (Leopold 1987, 158).

When a way of seeing becomes too comfortable, too habitual, it closes us off to what lies around the corner, to the nooks and recesses and hiding places which lie in all things. It’s only when we see that *seeing itself* is far more complex, that it requires a playing and experimenting with unusual, uncommon ways of noticing, that we can hope to get beyond the deceptive surface of things.

And here is one of the great ironies of Leopold’s text: however “poetic,” and however ruthlessly skeptical of science, the text is itself consummately scientific — at least in the grandest and most ancient sense of science. Aristotle refers to philosophy (which for him is “first science”) as the art that speaks to the most essential human yearning: the desire to see in a way that goes beyond the mere surface and appearance of things to a deeper recognition of meaning.⁸ Science is born in wonder, in curiosity, in the experimentation with different perspectives, in the testing out of different ways of seeing and conceiving things. It is only when science becomes weary of itself, institutionalized into a rigid set of principles and procedures, that it comes to codify one way of seeing as official. In a sense, Leopold is attempting to return science to its origins, to rearticulate, through the very form of the play of styles in his text, the possibilities of a grand science. For Leopold, this will be what might be called a “poetic science.”

In one sense, Leopold’s series of translations of his text, from the lighthearted poetry of Part I, to the melancholic poetry of Part II, to the discursive and “logical” essays of Part III, reflects a necessity inherent in the project of experimenting with different ways of seeing: for Leopold, to see in different ways implies the search for different ways of *speaking*. A distinctive form of perception requires a distinctive form of language. What’s so fascinating about Leopold’s experimentation with linguistic styles and idioms is that he is never complacent about his ability to discover the “right” language to express a particular form of perception. Indeed, he seems to take delight in always “failing,” in always falling short.

In the “Marshland Elegy” essay, Leopold writes “our ability to perceive quality in nature begins, as in art, with the pretty.” Our initial, most common way of perceiving nature is in terms of a simplistic and reductive aesthetic: “isn’t that pretty?” But, Leopold continues, this ability to perceive quality “expands through successive stages of the beautiful to values *as yet uncaptured by language*.” There is a way of perceiving which transcends the categories of even the profoundest aesthetic philosophies and our ability to categorize them in the language of such philosophies. He continues further to speak of one of the great inhabitants of the Clandeboye marsh, the crane: “the quality of cranes lies, I think, in this higher gamut, as yet beyond the reach of words” (Leopold 1987, 96).

Over and over again throughout the *Almanac* Leopold wonders at what the “other” creatures know and perceive and think, at what this “other” perception would be like, beyond the reach of our language. This the ultimate test of perception Leopold sets for himself (and for the poetic science he is experimenting with): what would it mean to perceive from the perspective of the other-than-human? Our perception is always *of* the “other,” never *by* the other: this is obvious, it’s a prepositional absurdity to say “I have a perception *by* the other.” What we see is always on the “outside” of the self, an “object” separated from the “subject,” just as grammatically, the subject of a proposition holds the place of honor and all predicates are referred back to it. But then notice the tragedy of seeing: the very act of perception demands its own failure — what we seek to know must remain outside, hence not truly known, must remain a mere object, something which can only be redefined and reshaped by the subject who perceives it.

For perception to succeed in its purpose, for it to yield knowledge of the “other,” it would have to see from the perspective of the other, to make the object into the *subject* of perception. Martin Buber, the great Jewish mystic who was roughly contemporary with Leopold and who, like Leopold, was experimenting with ways of confounding our ordinary understanding of the subject-object relationship, writes the following striking passage in his essay on “Dialogue”: “That inclination of the head over there — you feel how the soul enjoins it on the neck, you feel it not on your neck but on that one over there, on the beloved one” (Buber 1968, 29).⁹ What would this be like? What would it mean to experience the other from her own position, to feel the inclination of the head *on that neck over there*? What would it mean to “think like a mountain,” as Leopold puts it in perhaps his most famous essay? And what would the language look like that expressed such perception? What would it mean to “know the speech of hills and rivers” (Leopold 1987, 149)?

Leopold, like any author, speaks - he gives words to his perceptions. In the “Marshland Elegy” essay, his words invoke an ecological and evolutionary perception of the marsh:

When we hear the call of the crane we hear no mere bird. We hear the trumpet in the orchestra of evolution. He is the symbol of our untamable past, of that incredible sweep of millennia which underlies and conditions the daily affairs of birds and men. And so they live and have their being - these cranes - not in the constricted present, but in the wider reaches of evolutionary time.

... Amid the endless mediocrity of the commonplace, a crane marsh holds a paleontological patent of nobility, won in the march of aeons, and revocable

only by shotgun. The sadness discernable in some marshes arises, perhaps, from their once having harbored cranes. Now they stand humbled, adrift in history. (Leopold 1987, 97)

These words are not, to be sure, the words of the crane or the marsh themselves. They are Leopold’s words, expressing his perception. What is remarkable about his language, though, is that it insists upon its own inevitable incompleteness. Paradoxically, what he is speaking about is beyond the reach of language.

Lao Tzu, the purported author of the *Tao-te Ching*, opens his wondrous and enigmatic poem to the “Tao,” or “Way,” by saying that “The Tao that can be told of is not the eternal Tao / The name that can be named is not the eternal name” (verse 1) — confronting the reader with the puzzle of an author seeking to express what he insists in the same breath is inexpressible. Just as part of the uncanniness of the *Tao-te Ching* is the reader’s sense that Lao Tzu is fully aware of his authorial predicament, the careful reader of Leopold’s *Almanac* comes to see that Leopold is perfectly conscious of the paradox of his own project. Like Lao Tzu, Leopold achieves a way of speaking which calls attention precisely to the limits of language. His experimentation with a poetic translation of scientific observation ironically expands the possibilities of the enterprise of science precisely through questioning the sense of certainty we can achieve through “objective” description.

In a sense, we might call Leopold’s science an *ecstatic* science. “Ecstasy,” from the Greek *Ek-stasis*, literally means “standing outside” or “standing above.” In ecstasy we stand beyond ourselves, outside of ourselves. An ecstatic science is one that points beyond itself to its other, to poetry, in such a way that the “other” is not its refutation or contradiction but its complement.¹⁰ Leopold’s science, his fascination with and absorption in description of the external world, in its attempt to find understanding and explanation, invokes from out of itself a transcendence beyond the merely particular and concrete to a domain which is hidden from ordinary sensation and requires a new language. Above all, Leopold’s poetics, his narration of his encounter with the landscape and its inhabitants, is a discourse grounded in a responsiveness to the poetry of nature itself (“whereas I write a poem by dint of mighty cerebration, [the grebe] walks a better one just by lifting his foot” [Leopold 1987, 160]), a dialogue with rather than a detached observation of what he sees.¹¹

Song of the Gavilan: from Romanticism to Poetic Science

While comments about science, scientific method, and scientific education are sprinkled throughout *A Sand County*

Almanac, it is in his essay from Part II (the “Sketches”) on “The Song of the Gavilan” that Leopold makes his most sustained and trenchant remarks about science. There are five paragraphs on science at the close of this wonderfully peculiar essay which opens with the mystical description of a river in Northern Mexico, goes on to speculate about the native inhabitants who lived there hundreds of years ago, makes a few remarks about hunting, and offhandedly throws in a recipe for deer steaks. Then, with no evident preparation, Leopold begins to speak about science. “There are men charged with the duty of examining the construction of the plants, animals, and soils which are the instruments of the great orchestra [of nature]. These men are called professors [of science]. Each selects one instrument and spends his life taking it apart and describing its strings and sounding boards. This process of dismemberment is called research. ... One by one the parts are thus stricken from the Song of Songs. If the professor is able to classify each instrument before it is broken, he is well content” (Leopold 1987, 153).

On the face of it, these comments about science don’t seem particularly profound. We might describe them as a sort of recapitulation of the science-bashing the romantic poets took such pleasure in. Wordsworth writes in *The Tables Turned*:

*Sweet is the lore which Nature brings;
Our meddling intellect
Mis-shapes the beauteous forms of things:
We murder to dissect.* (ll. 25-28)

And in Goethe’s *Faust*, Mephistopheles says that scientists, in their eagerness to “docket living things past any doubt,” or to analyze and categorize the world of nature,

*... cancel first the living spirit out:
The parts lie in the hollow of your hand,
You only lack the living link you banned.
This sweet irony, in learned thesis
The chemists call naturae encheiresis [nature’s laboratory]
(Faust I, iv)*

There is no doubt that like the Romantic poets, Leopold is often didactic, rhetorical, and polemical in his comments about science. But like Blake, whose *Marriage of Heaven and Hell* includes some of the most scathing denunciation of science in all of romantic poetry, Leopold is ultimately looking for a “marriage” of what Blake — with intentionally provocative irreverence — calls Heaven (reason, science) and Hell (the heart, poetry). Perhaps there is something deeper going on beneath the polemical surface of the “Gavilan” essay. Perhaps, just as the essay opens with a play on two levels of meaning — “the song of the waters is audible to every ear, but there is other music in these hills, by no means

audible to all” (Leopold 1987, 149) — so too there is a deeper meaning to the paragraphs on science, something requiring translation.

The “Song of the Gavilan” essay itself goes through many shifts of tone and perspective. It begins, in fact, with a contrast between ordinary and extraordinary perception: “The song of a river *ordinarily* means the tune that waters play on rock, root, and rapid.” Leopold then describes this ordinary meaning: “The Rio Gavilan has such a song. It is a pleasant music, bespeaking dancing ripples and fat rainbows laired under mossy roots of sycamore, oak, and pine” (Leopold 1987, 149).¹² Recall the idea that “our ability to perceive quality in nature begins, as in art, with the pretty.” Here we have a river with a very pretty song: pleasant, dancing, riffing, rainbow-esque. And not only is the song pretty, “it is also useful,” Leopold says, since “the tinkle of waters so fills the narrow canyon that deer and turkey, coming down out of the hills to drink, hear no footfall of man or horse.” The song serves as *noise* to mute the hunter’s approach: “Look sharp as you round the next bend, for it may yield you a shot, and thus save a heart-breaking climb in the high mesas” (Leopold 1987, 149). Thus our ordinary perception of the river yields a purely human perspective, whether an aesthetic of the pretty or a utility of the hunt.

But then things change dramatically: “This song of the waters is audible to every ear, but there is other music in these hills, by no means audible to all.” The category of the “other” is introduced — an “other music” which cannot be discerned in any ordinary way. “To hear even a few notes of it you must first live here for a long time, and you must know the speech of hills and rivers.” Notice that the sort of perception called for here renders the common subject/object model of perception problematic. “To perceive” comes from the Latin *per* (thoroughly) and *capere* (to take). Thus to perceive is “to take thoroughly” (so too in German, *Wahrnehmen* is literally “to take the truth”): perception is a *taking* of the object by the subject. But to experience this “other music,” we must *hear, listen* — not take, but receive.¹³ And more, to do so one must first live in the place for a long time: this sort of receptive perception does not come quickly, but requires a lingering inside the space of the habitat or locale, a lingering in which we open ourselves to an other language, indeed radically other, “the speech of hills and rivers.”

*Then on a still night, when the campfire is low and
the 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, its notes the
lives and deaths of plants and animals, its rhythms*

spanning the seconds and the centuries. (Leopold 1987, 149)

I want to leave this description of a mystical, poetic perception of the river's music for a moment in order to attend to a few resonances from one of the most commented upon essays of the *Almanac*, "Thinking Like a Mountain." "Song of the Gavilan" is in fact in many ways a refrain — structurally, thematically, and musically — of "Thinking Like a Mountain."

The essay was written by Leopold explicitly to respond to his friend and unofficial editor Hans Hochbaum's chastisement in a letter of 1944 that Leopold's early drafts did not indicate his own straightforwardly *un-ecological* views about predator species during his early years as manager of national forests in New Mexico and Arizona (beginning in 1911 at the age of twenty-three), and thus missed an opportunity to show how conversion experiences are possible.¹⁴ Leopold opens "Thinking Like a Mountain" with the description of the howl of a wolf — although we won't know until the end of the second paragraph that it is a wolf's cry, so that the opening lines take on a disorienting sense of strangeness:

A deep chesty bawl echoes from rimrock to rimrock, rolls down the mountain, and fades into the far blackness of the night. It is an outburst of wild defiant sorrow, and of contempt for all the adversities of the world. (Leopold 1987, 129)

Leopold then turns, as he does in "Song of the Gavilan," to explain some of the common understandings of this sound:

Every living thing pays heed to that call. To the deer it is a reminder of the way of all flesh, to the pine a forecast of midnight scuffles and of blood upon the snow, to the coyote a promise of gleanings to come, to the cowman a threat of red ink at the bank, to the hunter a challenge of fang against bullet.

But beyond all these ordinary perceptions, there is a hidden, more profound meaning:

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. (Leopold 1987, 129)

As in "Song of the Gavilan," this deeper form of perception entails a deconstruction of the subject/object paradigm: what it would mean, in Leopold's words, "to decipher the hidden meaning" of the wolf's howl, would be to "think like a mountain." The subject of perception, the human mind, is decentered, dislocated, replaced by what was the "object," the

environment, nature, the mountain, which was "outside" us. For us to perceive the hidden meaning, we must somehow dis-place ourselves from our common position as subjects set over against objects and merge into the "vast pulsing harmony" of the place itself.

The essay "Thinking Like a Mountain" is an allegory about education, about self-transformation. Leopold describes a personal conversion experience into a new mode of perception by telling of a day he killed a wolf. One day, so Leopold's story goes, he was out in the wild with some companions,

eating lunch on a high rimrock, at the foot of which a turbulent river elbowed its way. We saw what we thought was a doe fording the torrent, her breast awash in white water. When she climbed the bank toward us and shook out her tail, we realized our error: it was a wolf. ...

In those days we had never heard of passing up a chance to kill a wolf. In a second we were pumping lead [in her direction]. ... When our rifles were empty, the old wolf was down. ... (Leopold 1987, 129-130)

Then something happens to Leopold. He approaches the dying wolf, and reaches her

in time to watch a fierce green fire dying in her eyes. I realized then, and have known ever since, that there was something new to me in those eyes — something known only to her and to the mountain. I was young then, and full of trigger-itch; I thought that because fewer wolves meant more deer, that no wolves would mean hunters' paradise. But after seeing the green fire die, I sensed that neither the wolf nor the mountain agreed with such a view. (Leopold 1987, 130)

The lesson Leopold derives from this conversion experience is an ecological one:

Since then I have lived to see state after state extirpate its wolves. I have watched the face of many a newly wolfless mountain, and seen the south-facing slopes wrinkle with a maze of new deer trails. I have seen every edible bush and seedling browsed, first to anemic desuetude, and then to death. I have seen every edible tree defoliated to the height of a saddlehorn. In the end the starved bones of the hoped-for deer herd, dead of its own too-much, bleach with the bones of the dead sage, or molder under the highlined junipers. I now suspect that just as a deer herd lives in mortal fear of its wolves, so

does a mountain live in mortal fear of its deer.
(Leopold 1987, 131-32)

To “think like a mountain,” however mystical, however extraordinary its demands upon our perception, has highly practical ecological consequences: to think like a mountain is to think ecologically, from the perspective of the welfare and flourishing of what is normally “outside” and “other” to us, the environment itself.

The shift in “Thinking Like a Mountain” from “pumping lead” to the experience of the “fierce green fire” — from the ordinary to the profound, from the short-sighted to the ecological — is mirrored in the “Gavilan” essay. After Leopold introduces us to the “vast pulsing harmony” which lies hidden and unheard beneath the noise of our common perception of the Rio Gavilan, he turns directly, as he did in “Thinking Like a Mountain,” to an ecological perspective:

The life of every river sings its own song, but in most the song is long since marred by the discords of misuse. Overgrazing first mars the plants and then the soil. Rifle, trap, and poison next deplete the larger birds and mammals; then comes a park or forest with roads and tourists. Parks are made to bring the music to the many, but by the time many are attuned to hear it there is little left but noise.
(Leopold 1987, 149-50)

In the next few paragraphs, leading up to the conclusion of the essay where he makes his remarks about science, Leopold plays out this ecological motif through a typical series of contrasts and oscillations. The dualities of use and misuse, music and noise, harmony and discord, are explored both temporally and spatially. Temporally, the present — with its warning signs of environmental damage — is contrasted both to the past, where “there once were men capable of inhabiting a river without disrupting the harmony of its life” (Leopold 1987, 150), and to the future:

some day my buck will get a .30-.30 in his glossy ribs. A clumsy steer will appropriate his bed under the oak, and will munch the golden grama [or pasture grass] until it is replaced by weeds. Then a freshet [an overflowing stream] will tear out the old dam, and pile its rocks against a tourist road along the river below. Trucks will churn the dust of the old trail on which I saw wolf tracks yesterday.
(Leopold 1987, 151)

Spatially, the terrain of the river habitat as experienced through ordinary perception is contrasted to a perception which deciphers hidden meaning: “To the superficial eye the Gavilan is a hard and stony land ... but the old [er inhabitants] ... were not deceived; they knew it by experience to be a land

of milk and honey” (Leopold 1987, 151). So too, the purely human perspective is contrasted with the ecological: Leopold tells of the excitement of hunting of a deer, and even seeks to entice us with his recipe, a “gastronomic epitome,” for deer steaks (Leopold 1987, 150, 151-52), but he speaks also of the tragedy of the day the buck will be replaced by the steer, the golden grama by weeds, the old trail by the tourist road. And he places the human drama of the hunt in the larger context of food cycles: “food for the oak which feeds the buck who feeds the cougar who dies under an oak and goes back into acorns for his erstwhile prey” (Leopold 1987, 152-53).

This series of contrasts by which partial and common perception is perpetually negated by a more encompassing and ecological perception serves as the transition to what otherwise might seem to be an awkward leap into the final theme of the essay, the discussion of science. For it is just this larger perception that is absent in the official, institutionalized methodology of science as Leopold sees it. Here again are the lines Leopold opens his comments about science with:

There are men charged with the duty of examining the construction of the plants, animals, and soils which are the instruments of the great orchestra. These men are called professors [of science]. Each selects one instrument and spends his life taking it apart and describing its strings and sounding boards. This process of dismemberment is called research. The place for dismemberment is called a university. ... One by one the parts are thus stricken from the song of songs. If the professor is able to classify each instrument before it is broken, he is well content.

We murder to dissect.

A professor may pluck the strings of his own instrument, but never that of another. And if he listens for music he must never admit it to his fellows or to his students. For all are restrained by an ironbound taboo which decrees that the construction of instruments is the domain of science, while the detection of harmony is the domain of poets. (Leopold 1987, 153)

Science, Leopold continues, and it’s impossible not to be overwhelmed by the irony, “contributes moral as well as material blessings to the world. Its great moral contribution is *objectivity*, or the scientific point of view. This means doubting everything except *facts*” (Leopold 1987, 153-54). Now Leopold himself is much taken with facts — facts about birds and mammals and plants and trees and marshes and bogs abundant in the *Almanac*. But facts taken in isolation are mis-

leading. The great British analytic philosopher G. E. Moore once said that “a thing is what it is and nothing else.” Nothing seems more obvious to common sense. For Leopold, however, a thing is *never* just what it is in isolation, since as such it is detached and disconnected from its surroundings, from the “vast pulsing harmony” of its environment. The essence of a thing, what it truly is, lies in the series of relationships it has to this larger whole.

Leopold thus calls upon science to open itself to a meta-physics — a way of seeing beyond or above the characteristics of things as self-enclosed phenomena. One of the major achievements of the *Sand County Almanac* is the enactment of this meta-physics of seeing as an inherently aesthetic act. It is telling that in the famous statement of his “land ethic,” Leopold speaks of a thing being right to the extent that it preserves “the integrity, stability, and beauty of the biotic community” (Leopold 1987, 224f). Even more directly, in his essay on “Guacamaja” (in the Chihuahua region of Northern Mexico), Leopold proposes the idea of a “physics of beauty”:

The physics of beauty is one department of natural science still in the Dark Ages. Not even the manipulators of bent space have tried to solve its equations. Everybody knows, for example, that the autumn landscape in the north woods is the land, plus a red maple, plus a ruffled grouse. In terms of conventional physics, the grouse represents only a millionth of either the mass or the energy of an acre. Yet subtract the grouse and the whole thing is dead. An enormous amount of some kind of motive power has been lost. (Leopold 1987, 137)

Leopold’s conviction that “conventional physics,” which can only describe the land in terms of quantities of matter in space, must be reconfigured to include a “physics of beauty” where the scientist becomes attuned to and invests herself in the landscape, underscores his search for a more intimate and profound encounter with the otherness of nature.¹⁵

Conclusion

In his essay on the “Sky Dance” of the woodcock, Leopold does his best to describe the spectacularly elaborate performance that woodcocks give in the early evening hours of spring. But after several paragraphs of description, he acknowledges that there is much he cannot explain. A friend of his, Bill Feeney, was equally perplexed, and particularly by the incredible vocalizations of the woodcock. So he “clapped a net over a bird and removed his outer primary wing feathers; thereafter the bird warbled, but twittered no more” (Leopold 1987, 33).

Leopold’s comment: “but such an experiment is hardly conclusive” (Leopold 1987, 33). The puzzle of the complex vocalizations of the woodcock, “and many other questions as well,” he continues, “remain mysteries of the deepening dusk” (Leopold 1987, 34). And Leopold gives thanks for this mystery: “it is fortunate, perhaps, that no matter how intently one studies the hundred dramas of the woods and meadows, one can *never* learn all of the salient facts about any one of them” (Leopold 1987, 33). Bill Feeney murders to dissect: he clips the primary wing feathers of the bird so as to discover facts, but in the process he forgets the mystery.

The great moral contribution of science, its “objectivity,” is for Leopold (in his polemical and ironic mood) a single-minded dedication to facts which is oblivious to mystery, an “objectivity” which contrasts fundamentally to what we saw Leopold refer to as the objectivity of the Mountain: “Only the mountain has lived long enough to listen objectively to the howl of a wolf.” Only through the perspective of the mountain can we become attuned to the deeper meaning of the haunting music of the wolf’s howl, with all that it symbolizes for the complex interplay of lives and deaths within the habitat of the landscape.

I’ve said that Leopold is a scientist himself, and this in two senses. In the obvious sense, he is a scientist because he has the factual (if you will!) credentials of the scientist: those hundreds of articles published in scientific journals are hard to ignore. But it is impossible to understand the brutal indictment of science in “Song of the Gavilan” if we do not accept the more controversial sense in which Leopold is a scientist, a scientist in what I’ve called the grand manner of science, a scientist who explores the possibilities of a *poetic* science. The secret of “Song of the Gavilan” is that it is a confessional text, or better, an interior dialogue between two dimensions of Leopold’s soul. He is part of the world of science, his life has been given over to it; yet he warns himself never to forget the mystery, never to forget the value of what is left out of view by the scientific method, never to “learn to see one thing by going blind to another.” More ambitiously, Leopold’s *Almanac* is an attempt to search out a synthesis of these two dimensions of his soul, the scientific and the poetic — to write in a way so as to transgress the “ironbound taboo which decrees that the construction of instruments is the domain of science while the detection of harmony is the domain of poets.”

Leopold’s poetry *is* scientific: it is embedded in a fundamental yearning to see, to understand what is other; it is unremitting in its exploration of hypotheses; unrelenting in its experimentation and invocation of different perspectives; constant in its delight in discovery; ceaseless in its search for explanation and understanding; and invariable in the pleasure it finds in the concrete materiality of things. But his scientific

ic temperament is essentially poetic, a science in ecstasy, reaching out beyond itself to a domain of meaning which is enfolded in mystery; reaching down beneath itself to a region hidden by ordinary perception; reaching around its own corners to look for and love what is not seen directly and explicitly; reaching past its own subjectivity to the ineluctably enigmatic subjectivity of the other.

Endnotes

1. Author to whom correspondence should be directed:
E-mail: berthold@bard.edu.
2. For a more sustained analysis of Leopold's literary style than I am able to give in this article, see John Tallmadge's study of the literary techniques of *A Sand County Almanac* (Tallmadge 1987, 110-127). See also Robert Finch's Introduction to *A Sand County Almanac and Sketches Here and There* (Finch 1987, xv-xxviii).
3. Ribbens' essay is a splendid piece of scholarship which I have obviously relied upon heavily in my brief account of Leopold's "publishing blues."
4. My purpose is thus related to but somewhat different from the important analysis offered by several commentators on the *Sand County Almanac* that shows how Leopold's interest in scientific, ecological description is always already in the service of an *ethical* commentary. As J. Baird Callicott says, Leopold's land ethic involves a "direct passage from descriptive scientific premises to prescriptive normative conclusions" (Callicott 1982, 163). See also Marietta 1979. My own thesis only indirectly addresses Leopold's ethics, and stresses instead how in *A Sand County Almanac* Leopold the scientist is always already a poet. A more extended discussion would show, I am convinced, that Leopold's poetic impulse is inseparable from his ethics. Aristotle's famous claim that poetry is "of graver import" than history, since history merely accounts for what is, while poetry speaks of what might be (*Poetics* 1451b5), would, in this analysis, be adjusted to read that for Leopold, poetry speaks of what *ought* to be.
5. See Susan Flader's description of the sand country of central Wisconsin (Flader 1987, 40-62).
6. Peter Fritzell notes that despite the popularity of *A Sand County Almanac*, "no scientist has considered it much more than pleasant or moving material to be read at leisure" (Fritzell 1976, 22).
7. To be sure, Leopold often still rises to evocative and graceful language in these essays, but the predominately analytical style of Part III is deliberately intended to serve as a contrast to the lyricism of Parts I and II.
8. Aristotle, *Metaphysics* 982b 1-25.
9. John Tallmadge compares Leopold's conception of the "other" to Martin Buber's notion of an "I — Thou" (subject-subject) relationship as distinct from an "I — It" (subject-object) relation (Tallmadge 1981, 351-363).
10. Philip Cafaro compares Leopold to Thoreau and Rachel Carson in terms of their commitment to science on the one hand and insistence on its limits on the other hand, so that "science must be supplemented by personal acquaintance, appreciation, and celebration" (Cafaro 2001, 13f).
11. John Tallmadge makes the point that Leopold conceives of nature itself as a text with its own "language or system of signs," and strives throughout the *Almanac* to become an attentive reader of "the book of nature" (Tallmadge 1987, 124).
12. It is interesting to compare this language to that of "January Thaw," with its "tinkle of dripping water," and the curling and uncurling of the awakening skunk who "drags his belly through the snow" (see 5-6 above). Just as "January Thaw" is an intentionally lighthearted counterpoint to the darker and ecologically deeper message of "Marshland Elegy," so too in *Song of the Gavilan* the "pleasant music" of ordinary perception is contrasted to the "vast pulsing harmony" of extraordinary perception.
13. Leopold repeatedly seeks to subvert the acquisitive character of perception. This makes questionable Marti Kheel's comment that Leopold's choice of title for his work, *Great Possessions*, signifies his own disregard for the other's intrinsic value. The essay *Great Possessions* (in the "Sketches" of Part II) in fact ironically deconstructs the idea of possession as private property and replaces it with the concept of a receptivity to nature's intrinsic ecology.
14. Hochbaum's letter is cited in Ribbens 1987, 96. Hochbaum was also Leopold's original choice as illustrator for his manuscript. Roderick Nash describes Leopold's attitude towards predators during this early period: "one of Leopold's first projects was a campaign for the complete extermination of 'bad' predators (chiefly wolves and mountain lions) in the interest, he then believed, of helping the 'good' animals (cattle and deer)" (Nash 1989, 64). See also Donald Worster 1977, 270-71. Leopold began working for the National Forest Service in Apache National Forest in the Arizona Territories in 1909. He became deputy supervisor of the Carson National Forest in New Mexico in 1911, and then supervisor in 1913. In 1919 he became the chief of operations of the District 3 (Southwest) National Forest Service (Lorbiecki 1996, 39, 49, 83).
15. On Leopold's aesthetics, see for example Diffey 2000, 133-148; and Callicott 1987b, 137-171.

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