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SPRING 2025

THE EDITORS OF THE NEWSLETTER ASKED JACK WALDRON FOR A PERSONAL STATEMENT ON THE OCCASION OF HIS RETIREMENT AFTER 20 YEARS OF LEADERSHIP OF THE WONALANCET OUT DOOR CLUB. FROM HIS MANY WRITINGS AND ADDRESSES OVER THE YEARS, THIS IS THE ONE HE CHOSE.

Wonalancet, Weeks, and the White Mountains

The middle of the 19th century marked the beginning of two disparate developments. First, logging railroads made it possible to deliver increasing amounts of timber to mills. This resulted in large increases in the acreage of timber harvests. Frequently, the objective of logging operations was converting trees into cash, with little thought on how this would impact the forest ecosystems. Between 1850 and 1900 U.S. lumber production rose from 5.4 billion board feet to 44.5 billion board feet, an 8-fold increase.

The second development was an increasing environmental awareness by writers such as Henry David Thoreau and George Perkins Marsh as well as the Hudson River School of landscape painters. This mounting awareness led environmental advocates, up and down the eastern seaboard, to roundly criticize the damage being done to forests. One remedy they proposed was that the federal government purchase and protect forestland. They lobbied Congress to this effect but their efforts fell short, unable to overcome the dominant, commercial ethos of the culture. The Weeks Act marked a significant turning point. That turning point was not created by an environmental epiphany but rather the loss of ecological connectivity.

The forests of northern New England, and particularly northern New Hampshire, provided a ready supply of raw materials for the sawmills. Those same forested mountains also provided the power to run those sawmills in the form of rivers. As forests fell to feed the mills, rivers also fell. Springtime floods became commonplace, only to be followed by a bare trickle of water in late summer and autumn. The ecological connectivity of the land had been broken.

The Weeks Act did not solve this problem but rather represented a compromise. “Forest Reserves”, to use the parlance of the day, would be set aside and managed to “provide for navigable streams”. Those navigable streams would power the mills. The Weeks Act did not “preserve” the forests but rather changed the management of some forests from private interests to public interests. In the words of Gifford Pinchot, the public interest was to provide: “the greatest good, to the greatest number, for the longest time”.

The Weeks Act was a compromise that reflected a level of tolerance between two quite disparate groups, those seeking to convert natural resources into financial gains, and those for whom the healthy fabric of nature was paramount.

The Weeks compromise lasted about 40 years, until the end of World War II. During this time the new National Forests, east of the Mississippi, recovered their ecological health. The dark regime of forest fires that had dominated the White Mountain landscape

THIS ESSAY WAS FIRST PRESENTED IN THE WONALANCET UNION CHAPEL DURING THE WODC’S CELEBRATION OF THE 100TH ANNIVERSARY OF THE WEEKS ACT IN AUGUST 2011. THE ESSAY LOOKS BACK AT THE LEGACY OF THE WEEKS ACT AND WONDERS WHAT THIS GENERATION’S LEGACY MIGHT BE.

Jack Waldron, photo by Larry Labrie

faded. Verdant green replaced the smokey, black char of desolated hillsides. The transition from private to public management of the forests worked well until politics overtook the Forest Service. During World War II home building supplies had been rationed. After the war the country faced a shortage of housing for returning veterans. The political powers in Washington decided that the timber in the National Forests was needed for home building. The Forest Service's annual timber quotas were raised and "getting out the cut" became the unofficial motto of the Forest Service. One hundred years earlier forests were sacrificed for individual gain, now they were sacrificed for a perceived public gain.

Where single tree selection or small patch cuts had been done by the Forest Service, now there were clearcuts. This created an interesting vista on a mountainside in Colorado. The entire mountainside had been clearcut, a scene reminiscent of Paugus or other White Mountain peaks at the turn of the century. There was one difference. The naked mountainside was near a major road but hidden from view until a vehicle rounded a bend which revealed a mountain stripped clean of trees. Many drivers and passengers were known to blurt an expletive when the shocking scene appeared. The phrase "Oh my God" was heard so frequently that the vista was named the "Oh my God, Clearcut".

Public management of the forests had reverted to the same practices that had characterized private management. The short-term interests of humankind were placed above the long-term health and evolution of nature. Philosophers call this anthropocentrism. Man is considered to be the center of the universe, separate from and above nature. Both private and public management of the forest had been driven by an anthropocentric viewpoint and both had failed. A new compromise was needed, a compromise that shifted the philosophical perspective. That compromise arrived in another Congressional Act, the Wilderness Act of 1964.

The Wilderness Act brought the first glimmer of an ecocentric philosophy to the National Forests. Under this Act, most of our public lands would continue under public management. But a portion of our public lands would be set aside and left to evolve naturally. The Wilderness Act described it in this way:

"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and community of life are untrammeled by man, where man himself is a visitor who does not remain."

The Wilderness Act was a marvelous compromise. Most public land would continue to be managed within the ethos of the dominant, anthropocentric culture. But some public land would be set aside for natural processes to evolve free from the hand of man, an ecocentric approach. When viewed from an ecocentric perspective, man is considered an equal participant with all species and forms of life. Man is part of nature, not separate from it, and we are immersed in the mysterious dance of life, both physically and spiritually. Ecocentrism is not a new idea. It's been embodied in many cultures. In our own culture ecocentrism goes back at least to Copernicus who, in 1543, demonstrated that the earth was not the center of the universe and concomitantly neither was man. This is what Johann Wolfgang von Goethe had to say in the eighteenth century about the work of Copernicus:

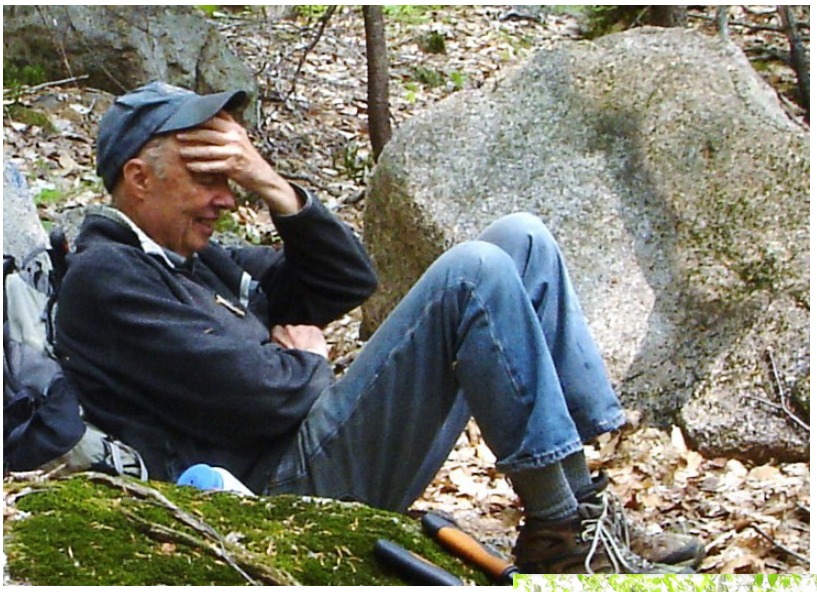
> "Of all discoveries and opinions, none may have exerted a greater effect on the human spirit than the doctrine of Copernicus. The world had scarcely become known as round and complete in itself when it was asked to waive the tremendous privilege of being the center of the universe. Never, perhaps, was a greater demand made on mankind – for by this admission so many things vanished in mist and smoke! What became of our Eden, our world of innocence, piety and poetry; the testimony of the senses; the conviction of a poetic-religious faith? No wonder his contemporaries did not wish to let all this go and offered every possible resistance to a doctrine which in its converts authorized and demanded a freedom of view and greatness of thought so far unknown, indeed not even dreamed of."

Goethe's words are pure poetry to my ear, but I'm sure they are not poetry to all ears. A diversity of ideas and opinions is as necessary for the health of a culture as a diversity of genes is necessary for the health of a species. This brings us to our question: what is the legacy of the Weeks Act? We need only look to the north to see a Weeks forest. A forest much more verdant and healthy than the pictures we see of that forest in 1911. That is the environmental legacy of the Weeks Act. But what is the cultural legacy of the Weeks Act. As we look north to those mountainsides we see both managed lands and Wilderness, we see compromise growing on the mountainside. That spirit of compromise requires

tolerance. That tolerance allows our culture to evolve in concert with nature.

What will be the legacy of our generation? Will we achieve as much as the Weeks Act generation? Will our culture continue to co-evolve with nature? Will we continue to promote and encourage tolerance? Will we continue to embrace compromise? The answers to these questions will determine our legacy. I sincerely hope that in a hundred years, in this Chapel, a speaker will describe our generation's legacy in Goethe's words: They demanded a freedom of view and greatness of thought so far unknown, indeed not even dreamed of.

Jack Waldron



Jack and a few
of our stellar WODC
trail workers from over the years.

All photos by Larry Labrie

EDITORIAL
Susan Goldhor
Doug McVicar

LAYOUT
Peggy Johnson

EDITORIAL STAFF ASKS FOR INPUT

We want to hear what you like and want as we plan future issues of the WODC newsletter. We devised a 2-minute questionnaire, accessible via the QR code to the right ⟶
or this link: https://forms.gle/nkePC2SgtX74sLfX9

A warm thank you to the few folks who responded to this request in the last issue. To everyone else: it really, actually, literally takes just two minutes. Come on, do your part.

SOIL: NOTES FROM THE UNDERGROUND

Essentially, all life depends upon the soil . . . There can be no life without soil and no soil without life; they have evolved together.

— Charles E. Kellogg, USDA Yearbook of Agriculture, 1938

In the course of a long life, I've had the good luck to meet some amazing people, and one of those was Diana Wall, who died in the spring of last year. Diana began her career as an expert on nematodes, a huge group of worms that seem to live anywhere there is moist organic matter (including deep underground in spent mines and in anoxic marine sediments). Of the twenty thousand species of nematodes that have been described, a quarter are soil dwellers. Nematodes are the most numerous of all animals in soil, and ubiquitous to the extent that one specialist wrote, "If all the matter in the universe except the nematodes were swept away, our world would still be dimly recognizable... we should find its mountains, hills, vales, rivers, lakes, and oceans represented by a thin film of nematodes." Nematodes led Diana to study soil ecosystems and food webs. Seeking out the simplest webs led her to carry out pioneering work on Antarctic soils, and her work on soils made her a leading voice in the increasingly urgent call to (quoting her 2015 editorial in *Science*) "give soils their due". The below ground is the largest and arguably the most diverse ecosystem on earth. It's what supports our forests, grows our food, filters our water, cycles nutrients, and stores carbon. More carbon is stored in soil than in the above ground soil dwellers — like trees. We are dependent upon healthy soil, just as we are dependent upon clean air and water, which are all interlinked. And yet we know very little about our planet's soils and what we do know has not been put to use by those whose work impacts the soil.

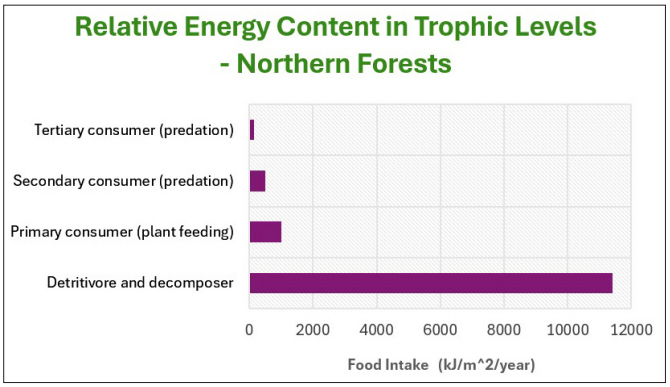
We know more about the movement of celestial bodies than about the soil underfoot." — Leonardo da Vinci

One problem with soil science is that most scientists are specialists. The backbone of soil is mineral. So geologists see rocks. If the rocks are tiny enough, it's sand. If they're really tiny, it's mud. If they're bigger or mixed size, it's what we deal with in the field or forest. But it's not soil until the biomass kicks in. So bacteriologists wax lyrical about the millions (billions?) of bacterial species in soil, pointing out that there are literally hundreds of pounds of bacteria in an acre of soil. Mycologists focus on the miles and miles of fungal hyphae moving through soil, decomposing organic matter and contributing those decomposition products to the forest or field flora; either piping it into trees and shrubs directly through mycorrhizal attachment, or simply contributing it to the glorious, gloopy mess of nutrients that is characteristic of healthy soil. Entomologists point out that with every step we take on healthy soil, our feet are resting on what they see as almost solid insect. (16,000 invertebrates under each foot has been estimated in a mature Oregon forest.) Even fifty years ago, the British entomologist J.M. Anderson, wrote that in some forest soils there were "up to a thousand species of soil animals . . . present in populations exceeding one or two millions per square meter." And a more recent publication makes the same point: "Microscopic protists, nematodes, and tardigrades inhabit the watery films surrounding soil particles. Slightly larger animals up to 2 millimeters in size, such as mites, springtails, and insect larvae*, live in the airy pores between those particles, helping make soil one of the most biologically diverse habitats on Earth." In fact, there are so many species of tiny (largely unidentified) insects and other invertebrates, comprising the micro- and meso-fauna of healthy temperate forest soils that their biodiversity is as great or greater than that of tropical forests. Those lush rain forests may have the above ground biodiversity, but we have the below ground. It's almost too much to take in, so it's probably not surprising that even scientists studying soil components fail to comprehend the incredible richness of the totality of soil.

"... for only rarely have we stood back and celebrated our soils as something beautiful, and perhaps even mysterious. For what other natural body, worldwide in its distribution, has so many interesting secrets to reveal to the patient observer?" — Les Molloy, *Soils in the New Zealand Landscape: The Living Mantle*

We are told, over and over again, that the biodiversity hotspots are in tropical forests. But what this really means is that the above ground biodiversity hotspots are in tropical forests. It's hard to blame those conservationists who show us pictures of elephants or gorillas or giant tortoises. These charismatic mega-fauna are not only more visible, but more likely to induce us to donate to their protection than a gloppy mix of bacteria, fungi and micro-fauna. But to the surprise of researchers, even tropical ecosystems have more biodiversity belowground. Here's a quote from a recent (Potapov et al., 2024) publication by tropical ecosystem researchers, who wrote (with barely restrained amazement), "We found that most of the energy in rainforests was channelled in belowground, rather than in aboveground, animal food webs. The total aboveground energy flux ... was 21.6 ± 9.7 with a total fresh animal biomass of 0.8 ± 0.6 g m–2, whereas the total belowground energy flux (sum of all energy fluxes to litter and soil arthropods and earthworms) was 295.8 ± 125.5 and the biomass was 9.5 ± 7.1 g m–2. These figures question the existing research focus on aboveground tropical food webs and animal biomass."

A graphic picture of who's eating what in a forest:



Once the belowground is included in the survey, it turns out that we can use the Appalachian Trail as a somewhat loose marker of a biodiversity hotspot — the only one outside of the tropics. Friends, we are hiking on a biodiversity hotspot! We just don't see it.

What we call topsoil, or sometimes duff, is more or less the upper 6 inches, and is almost totally organic, containing not only all of these organisms, but also bits and pieces of the forest debris, in lesser or greater stages of decay. But in a healthy forest or grassland, the living soil goes down further, stabilized and fed by roots and their exudates. We've all noticed signs offering topsoil for sale, or a contractor has promised to return our topsoil after completing work. But that's a lot like someone promising to board your pet and then returning its dead body. Without living tree roots to feed it; compacted in a pile without the free flow of air and water, what gets returned is no longer topsoil; it's just dirt.

"Civilization itself rests upon the soil."
— Thomas Jefferson

The topsoil on the Great Plains is estimated to have been 14-16 inches deep; black gold that not only withstood, but depended upon, the trampling hooves of buffalo. But it couldn't withstand the plow. It takes 500-1,000 years to form an inch of topsoil, but it didn't take that many years of plowing to create the Dust Bowl. In 2021, a UMass study showed that our corn belt (which used to be the Great Plains) showed no topsoil at all on convex slopes, while farming practices on the rest seemed calculated to increase erosion, and have already resulted in the loss of between a quarter to a half of this heritage of fertility. (https://e360.yale.edu/features/how-the-loss-of-soil-is-sacrificing-americas-natural-heritage) Verlyn Klinkenborg writes: "The authors aren't talking about reduced soil fertility or loss of mineral nutrients. They're talking about the complete removal of the medium in which crops are grown — the utter bankruptcy of the organic richness that lay for centuries under the tallgrass prairie." And, needless to say, the loss of both stored past carbon and the ability to store future carbon..

The nation that destroys its soil, destroys itself."
— Franklin Delano Roosevelt

But enough about the Dust Bowl and the loss of all that Flyover topsoil. How about us? When you think of New Hampshire's farms, what do you think of? Rocks? All those rock walls; all the rocks that are brought up when you dig? But if you'd moved here with the first white settlers, you wouldn't have seen rocks; you'd have seen topsoil. At least, if you looked below the plant cover. We didn't have as much as the midwest, thanks to the glaciers, but we had some. According to Peter del Tredici, a Harvard research botanist, it took less than a century of plowing and deforestation to destroy most of New England's topsoil. By the 1820s we were down to the rocky layer we see today. If we were flat, and if so many of our farms hadn't been abandoned to return to impoverished forest, we might

have had a little Dust Bowl of our very own.

What happens to forest soil in a clearcut? Basically, it dies. At best, it lives on as an impoverished version of what it was. Because here's something about trees that we don't see. They're leaky. It's been estimated that up to 40% of the carbs that they produce through photosynthesis get leaked out of their roots. Those nutrients don't go to waste; there are at least four and probably five kingdoms of creatures fighting it out down there to slurp them up. The mycorrhizal fungi may get special access via the structures they form on the growing root tips, but everyone else is taking advantage of this massive resource as well. The moist underground is a giant feast throughout the tree's growing season. And, when summer ends, a second, but very different, massive resource appears: fallen leaves. These get broken down by the saprobes, the fungal and bacterial rotters. Some of these have been hanging out in the forest floor, which almost always has some organic material to feed on, and a lot more rotters have been spending the relatively dry summer as endophytic symbionts in every leaf and petiole, waiting for leaf fall and wet weather so they can start breaking down and eating their former homes. Because rot is inherently messy, it provides food for everyone; sometimes even surpluses used up in the exuberance of sexual fruitings as some of the ectomycorrhizal fungi form the bodies we call mushrooms.

"If the soil is destroyed, then our liberty of action and choice are gone ..."
— W.C. Lowdermilk

So there are more living creatures in a handful of healthy forest soil than there are humans on earth, and all of these creatures are ultimately fed by the trees. Actually, each little community is fed by its tree. Each tree is maintaining a slightly different soil ecosystem, which makes sense when we think about it. And it doesn't take expensive equipment or a graduate degree in ecology to understand what happens to the soil when all the trees are removed in a clearcut.

Is it possible to harvest timber and maintain forest soil fertility? Yes, but it takes more time and more care, and you don't get every possible board foot. If you harvest individual trees, and protect the forest floor with slash mats or by using relatively small, light equipment, you can harvest timber and maintain healthy topsoil. In general, the Forest Service will tell you that's too difficult, and few if any companies are equipped for it.** To get a very different perspective on forest management and timber harvesting, you might want to watch some of the talks presented at the Yale Forest Forum's series on Tribal Forestry. This series made clear the differences between indigenous forestry and what we're used to. You can access the entire series at: https://yff.yale.edu/speaker-series/tribal-forestry-understanding-current-issues-and-challenges.

If you only want to watch one, I recommend Michael Dockry's April 11th presentation, making sure to include the Q&A portion. (Yale presents this series each year, with a different focus, and you can sign up for free.)

"People need to realize how powerful the transformation of soil can be."
— Ron Finley

l think we all know that there is no realistic Planet B, and it would be a much better idea to take the funds that go into developing systems for transporting a few bloated plutocrats to Mars, and use those funds to maintain the viability of Earth. And as we pollute, plow, compact, pave and scorch our planet's surface, Diana Wall would want us to remember two things. First, life on earth depends upon soil and its ability to clean water, to sequester CO2, and grow the food and forests we require. And second, that as we study and protect selected portions of our planet, we should pay less attention to the above ground and focus instead on the below ground. Let us note here that the creation of national parks, World Heritage Sites, and protected ecosystems has unleashed a flood of tourism that has burned unimaginable quantities of fossil fuels to reach those sites and, in some cases, destroyed them. We assure our readers that this will not be the case for especially biodiverse or unusual below ground protected areas. And yet, these are our true wonders.

Susan Goldhor

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* if we were writing about garden soils, we'd mention earthworms here; temperate and boreal forest soil should be earthworm free. The glaciers wiped out our native worms; any earthworm in our forest soil should be regarded as a destructive alien invasive and killed. Or, if you're soft-hearted, euthanized.

** some of our local loggers do beautiful work. And most of our clearcuts are very small. If you want to see clearcutting in its full brutality, fly over British Columbia. When I was working in Alaska, I took this route regularly and the vast checkerboard of clearcutting was literally painful to see.

Wall, Diana H. & Johan Six. *Science* 347 (6223): p. 695, Give Soils Their Due

DOI: 10.1126/science.aaa8493

CONNECTING THE MULTIPLE DIMENSIONS OF GLOBAL SOIL FUNGAL DIVERSITY, DOI: 10.1126/sciadv.adj8016).

Potapov, A.M., Drescher, J., Darras, K. et al. Rainforest transformation reallocates energy from green to brown food webs. *Nature* 627, 116–122 (2024). https://doi.org/10.1038/s41586-024-07083-y

1920
When Whiteface Went Viral

His Ashes Rest on Top of Mountain

Eastern papers carry an interesting account sent out from Wonolancet, N.H., of the interment in a high mountain peak of the ashes of the late Louis S. Tainter.

[*Dunn County* (WI) *News*]

Tainter was a lumber company lawyer and executive who became increasingly opposed to exploitative logging after he was hired to lead a timber company in the White Mountains. Working with the newly formed White Mountain National Forest, he transferred tens of thousands of acres of threatened private timberland to public ownership.

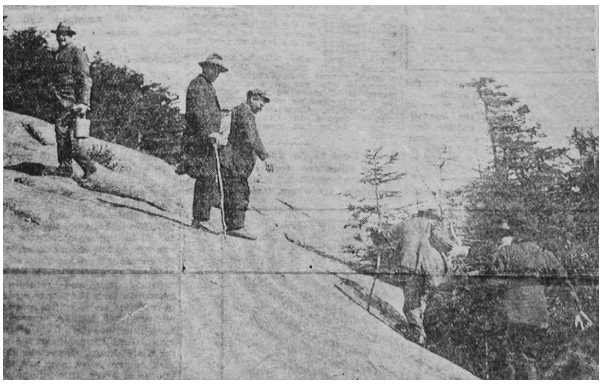
["Who Was Tainter?", May 1994 *WODC Newsletter*]

"Mt. Whiteface was the first peak Mr. Tainter had climbed on his inspection tour of 40,000 acres of forest domain. He frequently commented afterward on the beautiful view. He spent much time around the Mountain." [Eau Claire (WI) *Leader Telegram*]

"In Tainter's will was a request to have the body cremated, the ashes placed in an urn and embedded in the highest rock on top of Mt Whiteface."

[Springfield (MA) *Daily Republican*]

"The unostentatious character of the life of the late Louis S. Tainter, who was a prominent Boston business man, was reflected in the exercises attending placing his ashes in the topmost rock here above the clouds . . ." [Vancouver (WA) *Columbian*]



"At 9:30 they struck into the trail, leading through heavy brush tangled with deadwood, but picturesque with Fall coloring.

"The men proceeded single file, Mr. McCrillis acting as guide, and behind him went Loring D. Goulding with the ashes in a canister, weighing seven pounds. Although the guide maintained a fast pace, Mr. William D. Baker, a Civil War veteran, aged 72, with a pack of 40 pounds on his back, skipped around like a youngster.

"But not until the last mile and a half was reached did the ascent become treacherous. Here the path turned dizzily up the neck of the mountain, over the ledge, to the face. From this point to the summit the mountain rock was stripped of growth by landslides and was polished smooth." [*Boston Globe*]

"Six of Tainter's former associates brought his ashes over the trail and on their arrival at the mountain's summit found about 25 persons, including women, who had journeyed from surrounding towns to witness the simple service." [*Los Angeles Daily Herald]*

"Over the urn was placed the bronze table inscribed 'In the acquisition of lands for this national forest he rendered a notable service, and in conformity to his wish his ashes repose herein.'" [*Omaha Daily Bee*]

"Mount White Face, N. H. –
Louis S. Tainter, Bogat trgovec iz Bostona je umrl in določil v naprej, da se naj njegovo truplo vpepeli v krematoriju. Zgodilo se je tako in po končanem vpepeljenju je odslo 6 bivših tovarišev preminulega z njegovim pepelom v Appalachian pogorje."

[Chicago *Glas Svobode*]

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