National Cooperative Soil Survey Newsletter

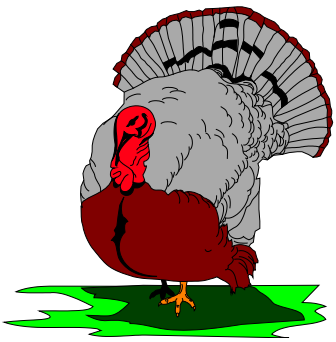
November 2011
Issue 57 Supplement

From issue 4, September 1998

Recipe for Baked Glasses

By Stanley Anderson, Editor, NRCS, National Soil Survey Center.

• Preheat oven to 350 degrees F.
• Season large turkey breast with salt and pepper.
• Place the turkey breast in a cooking pan and cover it with tinfoil.
• Roast the turkey at 350 degrees (20 minutes for each pound).
• About 1/2 hour before roasting is complete, remove the tinfoil and insert a meat thermometer in the fattest part of the turkey.
• Wait about 15 minutes before checking the temperature.
• After opening the oven door, remove your glasses to keep them from steaming over.
• Pay no attention to where you place the glasses.
• Close the oven door.
• Turn up the heat to 450 degrees so that the turkey will brown.
• Immediately start looking for your glasses.
• Check everywhere throughout the house, including the attic and the basement.
• Don't forget to check in the freezer.
• After about 15 minutes of looking, check in the oven.
• If the glasses are golden brown (like the turkey) and have shattered lenses, stick a fork in them. They're done.



From issue 10, February 2000

Language Matters

By Stanley P. Anderson, Editor, Natural Resources Conservation Service, National Soil Survey Center, Lincoln, Nebraska.

A linguistics professor was lecturing to his class one day. "In English," he said, "A double negative forms a positive. In some languages, though, such as Russian, a double negative is still a negative. However, there is no language wherein a double positive can form a negative."

A voice from the back of the room piped up, "Yeah, right." ■

From issue 11, May 2000

Language Matters

By Stanley P. Anderson, Editor, Natural Resources Conservation Service, National Soil Survey Center, Lincoln, Nebraska.

Bob Ahrens, Director of the National Soil Survey Center, sent me the following note, which is entitled “I or Me”:

> Knowing the case of a pronoun is imperative to proper grammar. Many people seem confused by pronouns, and one frequently hears “I’s” that should be “me’s.” For example, the subject of the sentence “Elvis and I are going to Memphis next week” is “Elvis and I.” “I” is the correct pronoun. The subject of the sentence “Are you going with Elvis and me?” is “you.” “Elvis and me” are objects of the preposition “with.” The correct pronoun is “me,” not “I.”

All I can add is that I am amazed when people who would never say, “Me ate the sandwich” will say such things as “Elvis and me ate all the grilled peanut butter and banana sandwiches.” I am amazed not only by the poor grammar but also by the facts. I thought that Elvis died back in the 70’s. ■

From issue 15, May 2001

Language Matters

By Stanley Anderson, Editor, USDA, Natural Resources Conservation Service, National Soil Survey Center, Lincoln, Nebraska.

Note that the wording of the following recommendation probably fails to express the author’s intended meaning: “Shorten the timeframe in which soil survey information is available to the customer.” ■

From issue 17, November 2001

Language Matters

By Stanley Anderson, Editor, USDA, Natural Resources Conservation Service, National Soil Survey Center, Lincoln, Nebraska.

For reasons that remain mysterious to me, my former boss (now retired) cited me as the contact person for a list of “factoids” that NRCS posted on the Web during the centennial of the National Cooperative Soil Survey. These factoids were collected from Bob Ahrens, Berman Hudson, and other NRCS soil scientists. They were submitted to me for editing. I spent less than 1 hour on them and then forgot about them, until people started calling me to ask about the validity or source of the factoids. An innocent bystander, I had no idea how to answer the questions, which I learned to fob off on Tom Reedy, a soil scientist at the center who sits near me.

The queries about the factoids discontinued after a while, until August 30 of this year, when an employee for National Geographic called me.

I believe she was an editor charged with the responsibility of checking both the facts and the factoids to be included in a story about soil erosion that was to appear in an upcoming issue of National Geographic. As soon as she used the word “factoid,” I tried to fob her off on Tom, but she asked her question anyway. She was concerned about the following factoid:

> In the spring of 1934, a dust storm originating in the Great Plains carried an estimated 200 million tons of soil to the Northeastern United States and out to sea. This storm caused “muddy rains” in New York and “black snows” in Vermont.

She asked me whether the measurement was in metric tons or in short tons. I had never heard of a metric ton (or a short ton, for that matter) and thought that a ton was a ton (2,000 pounds), so I told her that I was not the person to ask, that I would transfer her to Tom. “Just tell me this,” she responded. “Does the USDA have a policy about reporting metric or short tons?” Again, I had never heard of a metric ton, so I transferred her to Tom, though I listened to his end of the conversation.

The editor indicated that the Discovery Channel had a similar factoid, but one that estimated that 350 million tons was removed from the Great Plains in a dust storm in 1934, probably in the same storm referred to in the NRCS factoid. She wanted to know which figure to use. She said that she was inclined to use the NRCS number because, after all, it came from the Federal Government.

I have reservations about her reasoning.

First, since this phone conversation I have learned that 1 short ton is the equivalent of 0.907 metric ton. Thus, the difference between a short ton and a metric ton does not explain the discrepancy between the different figures in the two factoids (200 million tons and 350 million tons).

Second, I wonder about the term “factoid.” The suffix “oid” implies that the term refers to something that resembles a fact without actually being one, that it refers to a sham fact or a false fact. The Random House Dictionary of the English Language, second edition, 1987, defines the term as follows:

> something fictitious or unsubstantiated that is presented as fact, devised especially to gain publicity and accepted because of constant repetition.

The fact is, the meaning of the term appears to be drifting, so that it can now describe not only sham facts but also ones that can be verified, for example, by National Geographic. That is to say, the term can now refer to valid facts. If this is the case, I wonder how a “valid” factoid differs from an ordinary fact. Perhaps, the difference is that the factoid is somehow extraordinary.

Third, studying the NRCS factoid more closely, I wonder why National Geographic wanted to verify it at all. The statement defines itself as an estimate. Note the words “an estimated 200 million tons of soil.” Also, consider the end of the first sentence, where the 200 million tons is carried not only to the Northeast but also “out to sea.” Imagine measuring that. It appears that this factoid is a horseback opinion, that the number “200 million” was pulled out of thin air, as it were. In other words, this is a factoid in the original sense of the term. ■

From issue 18, February 2002

Language Matters

By Stanley Anderson, Editor, USDA, Natural Resources Conservation Service, National Soil Survey Center, Lincoln, Nebraska.

The following is from the unedited proceedings of the 2001 NCSS Conference: “Partner with the primate sector.” ■

From issue 22, February 2003

A Note on “40-Odd Sonatas”

By Stanley P. Anderson, Editor, National Soil Survey Center, NRCS, Lincoln, Nebraska.

When I started working as a soil survey editor in 1974, soil scientists in the Soil Survey Division let the editorial staff know that they were confused about how we hyphenated terms for drainage classes. We hyphenated “well-drained soil” but did not hyphenate the other drainage terms because they include ly adjectives (as in “poorly drained soil”). Also, we did not hyphenate “well drained” when it occurred as a predicate adjective (as in “The soil is well drained”). We were following the rules of style manuals, including the *GPO Style Manual*, which specifies the following (page 78):

> **6.18.** Print without a hyphen a compound predicate adjective the second element of which is a past participle. Omit the hyphen in a predicate modifier of comparative or superlative degree.

The manual includes the following among the examples of rule 6.18: “The paper is fine grained.”

The other relevant GPO rule is as follows (page 78):

> **6.20.** Do not use a hyphen in a two-word unit modifier the first element of which is an adverb ending in ly, nor use hyphens in a three-word unit modifier the first two elements of which are adverbs.

This rule applies to the *ly* drainage terms, such as “very poorly drained” and “poorly drained.” The editors decided to banish the hyphens in “well-drained soil” and in color terms, such as “yellowish-brown,” which were also perplexing to soil scientists (and to editors). I had no strong attachment to the hyphen in “well-drained soil” and rejoiced at the banishment of hyphens in color terms. Bill Hamilton, the head of the Soil Survey Editorial Staff in Hyattsville, Maryland, informed the Department of Agriculture that we were sending these hyphens into exile.

Having removed the hyphen in “well-drained soil,” the editors were obliged to, uh, dehyphenate similar terms, such as “fine-textured soil” and “fine-grained soil.” We thought that we needed a new rule for editors to follow. Noting that I was a budding Ph.D. type, Bill Hamilton asked me to write the rule. My notion was that we should hyphenate a unit modifier if one of the elements is a noun, as in “land-use planning” and “organic-matter content.”

Hamilton passed around my new rule, which was promptly ignored by most of the editors on the staff. These editors included Phil Chavez, who was editing the prewritten material, in which I noted numerous instances of “organic matter content” and “land use planning.” So much for my new rule.

I did not wish to reedit the prewritten material, so even I gave up on my clever little rule, deciding that the only time a hyphen must be used is when the meaning is affected, as in “40-odd sonatas” and “40 odd sonatas.”

When I edited the 2002 Soil Planner, I followed the lax “40-odd-sonata” rule and thus did not hyphenate “well drained soil.” At the last minute, the planner was reviewed by an editor in the Department of Agriculture, who added hyphens not only in references to “well drained soils” but also in the sentence “Antigo soils are well drained.” I did not object to the hyphen in “well-drained soils,” but I asked that the hyphen added to the sentence about Antigo soils be deleted because it violates GPO rule 6.18. When the planner was published, I turned to the pages for December and looked for the description of drainage, which reads as follows: “Antigo soils are well-drained.” The offending hyphen speared me in the eye. ■

From issue 23, May 2003

The Lewis and Clark Expedition at Council Bluff

By Stanley P. Anderson, Editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

The Lewis and Clark Expedition held its first official council with Native Americans on August 3, 1804, at a site in what is now Washington County, Nebraska. Clark's map of the Missouri River in this area identifies this site as "Councell Bluff."

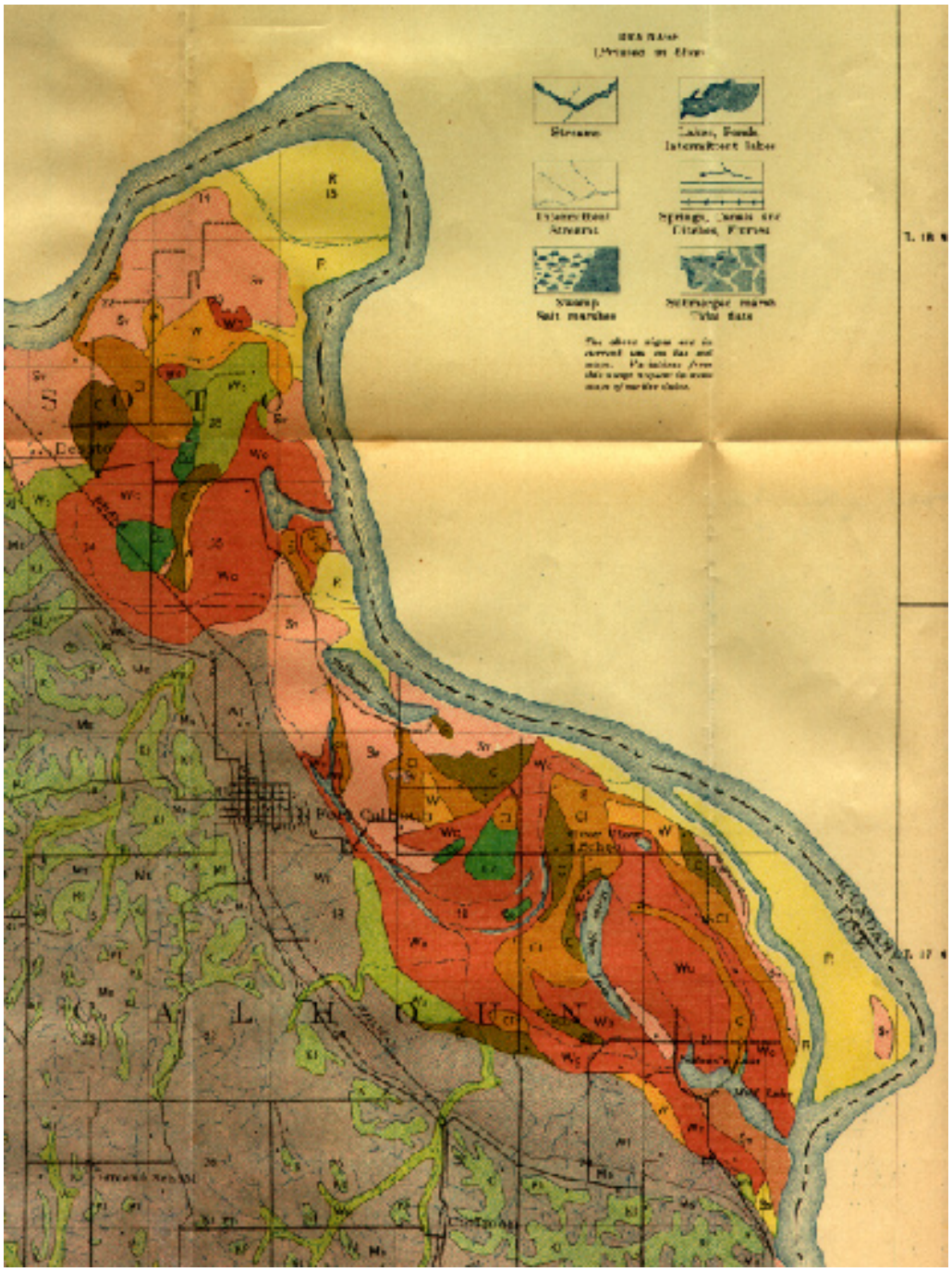
Clark's journal entry for July 30 identifies the various levels of the landscape at Council Bluff. It also identifies the kind of vegetation, including grasses that are 10 to 12 inches tall on a "high Prarie" above their camp and 5 to 8 feet tall on a prairie below the camp. The journal indicates that the soil is "of good quality" (Moulton, 1987, vol. 2, pp. 430 and 434).

After walking to one of the highest points on the landscape, Clark observed the "Countrey" as "one Continual Plain as fur as Can be Seen, from the *Bluff* on the 2d rise imediately above our Camp the most butifull prospect of the River up & Down and the Countrey opsd. prosented it Self which I ever beheld" (Moulton, 1987, vol. 2, p. 430). This description shows the enthusiasm with which members of the expedition responded to the vast, nearly treeless prairies of the Great Plains. An earlier example of this enthusiasm is recorded in Clark's journal for July 19, 1804. As Clark was pursuing elk in an area near what is now Nebraska City, he was enchanted by a view of the prairie:

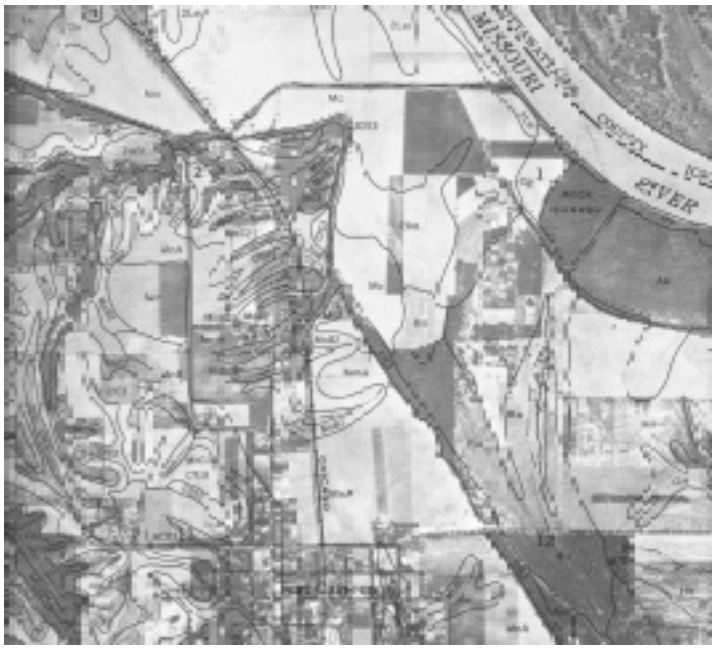
> Came Suddenly into an open and bound less Prarie, I Say bound less because I could not See the extent of the plain in any Derection, the timber appeared to be confined to the River Creeks & Small branches, this Prarie was covered with grass about 18 Inches or 2 feat high and contained little of any thing else, except as before mentioned on the River Creeks &c, This prospect was So Sudden & entertaining that I forgot the object of my prosute and turned my attention to the Variety which presented themselves to my view (Moulton, 1987, vol. 2, p. 394).

As he looked out over the river at Council Bluff on July 30, Clark was afforded a panoramic view of "Two ranges of High Land parrelel to each other and from 4 to 10 miles Distant between which the river and its bottoms are Contained. (from 70 to 300 feet high)" (Moulton, 1987, vol. 2, p. 430). This view is sketched on his map.

Council Bluff as drawn on Clark's map (from *The Journals of the Lewis and Clark Expedition*, vol. 1). At the time of the expedition, the Missouri River touched the bluff.



Council Bluff as it appears in the Soil Survey of Washington County, Nebraska, published in 1917. The date of the map is 1915. Council Bluff is just east of Fort Calhoun. The long and narrow body of water between the words "Fort" and "Calhoun" on the map may indicate the old course of the river and may be the approximate landing site for the Lewis and Clark Expedition more than 100 years earlier. A flood plain separates the Missouri River from the bluff where the expedition landed.



Council Bluff as it appears on map sheet 24 in the *Soil Survey of Washington County, Nebraska*, published in 1964. The map was compiled in 1962. The long and narrow area of water in the 1919 survey is now a soil—CfE3 (Crofton silt loam, 18 to 30 percent slopes, eroded).

Council Bluff as it appears on the latest soil map (1988). This map is from a new soil survey of Washington County that is being prepared for publication.

In a document written the following winter at Fort Mandan, Meriwether Lewis describes Council Bluff. He apparently had Clark's map of the site in front of him as he wrote:

> the base of the Bluff is washed by the river about a mile; it is about 60 feet high & nearly perpendicular; at it's lower extremity it leaves the river nearly at right angles, descending with a handsome and regular declivity on it's lower side about forty feet to a high, level, fertile and extensive bottom, lying between itself and the river. the top of the bluff is a level plain from one to two miles in width, and about five miles in length (Moulton, 1987, vol. 3, p. 353).

Both Lewis and Clark thought that Council Bluff would be a suitable site for a fort and trading post, partly because of the panoramic view of the river that the site provided at that time. Lewis thought that the main problem with building a fort at this site would be the scarcity of timber, but he noted that the soils in the area appeared to be good sources of clay for bricks. Fort Atkinson was later built at the site (mainly from timber in the immediate vicinity). It was in operation from 1819 to 1827. It has been restored and is open to visitors. Today, a good view of the Missouri is not possible from this spot because the river has shifted its course. ■

From issue 24, August 2003

Mark Twain on Climate and Soil in Nevada

By Stanley P. Anderson, Editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

In a newspaper item entitled "Washoe.—'Information Wanted'," Mark Twain comments on the climate and soil of Nevada. This item was first published in the Virginia City *Territorial Enterprise* in May of 1864. It is included in *Mark Twain: Collected Tales, Sketches, Speeches, & Essays, 1852–1890*, edited by Louis J. Budd (pages 78-82). The item was written in response to a series of questions about Nevada that a man named William (last name withheld) sent from Springfield, Missouri. The first of these asked about the character of Nevada's climate, and the second asked about what William called "the productions of the earth."

Following is Twain's description of "the productions of the earth" in Nevada:

> What are the productions of the earth? You mean in Nevada, of course. On our ranches here, anything can be raised that can be produced on the fertile fields of Missouri. But ranches are very scattering—as scattering, perhaps, as lawyers in heaven. Nevada, for the most part, is a barren waste of sand, embellished with melancholy sage-brush, and fenced in with snow clad mountains.

Here is Twain on Nevada's climate, which in his description appears to be xeric:

> It has no character to speak of, William, and alas! in this respect it resembles many, ah, too many chambermaids in this wretched, wretched world. Sometimes we have the seasons in their regular order, and then again we have winter all the summer and summer all winter. Consequently, we have never yet come across an almanac that would just exactly fit this latitude. It is mighty regular about not raining, though, William. It will start in here in November and rain about four, and sometimes as much as seven days on a stretch; after that, you may loan out your umbrella for twelve months, with the serene confidence which a Christian feels in four aces. Sometimes the winter begins in November and winds up in June;

An area of the Orovada series, which is Nevada's state soil. Orovada soils are classified as Xeric Haplocambids. Semiarid rangeland covered with brush and grass is in the foreground, and low mountains of rock outcrop are in the background.

> and sometimes there is a bare suspicion of winter in March and April, and summer all the balance of the year. But as a general thing, William, the climate is good, what there is of it.

Tommy Calhoun, who formerly was the State Soil Scientist in Nevada, sent me the following comments about Twain's description:

> It's pretty accurate, except for the statement that most of Nevada is a barren waste of sand. Very little is sand. A lot is saline, and the soils are often called sand because of their unproductivity. He also says that anything grown in Missouri can also be grown on the Nevada ranches. He leaves out the fact that in Nevada water must be applied. His characterization of the Nevada climate, what there is of it, is quite accurate. The year we moved from Nevada, I had to go out and cover my tomato plants to protect them from frost on June 29th. I remember that date specifically because it is my birthday.

The pattern of rainfall in Nevada is briefly described in chapter LV of *Roughing It* (1872). Twain notes that a rain shower late one afternoon was "astonishing" because "it only rains (during a week or two weeks) in the winter in Nevada, and even then not enough at a time to make it worthwhile for any merchant to keep umbrellas for sale."

Twain comments on another element of the Nevada climate, the wind, in chapter XXI of *Roughing It*, noting that in summer "the daily Washoe Zephyr" is a "pretty regular wind," that its "office hours are from two in the afternoon till two the next morning," and that it is accompanied by "a soaring dust drift about the size of the United States set up edgewise." This "vast dust cloud" is "thickly freckled with things strange to the upper air," including, from the highest to the lowest elevation:

"hats, chickens, and parasols sailing in the remote heavens"

"blankets, tin signs, sagebrush and shingles a shade lower"

"doormats and buffalo robes lower still"

"shovels and coal scuttles on the next grade"

"glass doors, cats, and little children on the next"

"disrupted lumberyards, light buggies, and wheelbarrows on the next"

and, 30 or 40 feet above the ground, "a scurrying storm of emigrating roofs and vacant lots."

Twain adds that the wind is responsible for the large number of bald people in Carson City, noting that it "blows the hair off their heads while they are looking skyward after their hats." ■

A Mark Twain Story on Agriculture

By Stanley P. Anderson, Editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

For idle amusement, check out the Mark Twain story "How I Edited an Agricultural Paper Once," first published in *Galaxy* in July 1870. This story is available in collections of Twain's works, including *Mark Twain: Collected Tales, Sketches, Speeches, & Essays, 1852–1890*, edited by Louis J. Budd (pages 412-417).

In the Buffalo *Express* for April 12, 1870, Twain announced his intention to edit a monthly "department" in the *Galaxy*. He described this announcement in "A Couple of Sad Experiences," which was published in the June 1870 issue of *Galaxy* (reprinted in Budd, ed., pages 388-395). The announcement, called a "squib," was done as a burlesque that backfired on Twain. Giving broad hints that he was joking, the squib claimed that the column would be an "Agricultural Department." These hints included references to "launching a triumphal *barge* upon a *desert*, and planting a *tree* of prosperity in a *mine*." To show that he was not serious about attempting an agricultural column, he admitted in a postcript that he knows nothing about agriculture. This admission was his biggest mistake, for it "seems to have recommended my proposed Agriculture more than anything else." He was deluged with queries from farmers who perhaps were hasty readers or were bored by "the oracular profundity" of know-it-all agricultural editors. The farmers wanted to know "about potatoes, and cabbages, and hominy, and vermicelli, and macaroni, and all the other fruits, cereals, and vegetables that ever grew on earth." Thus, Twain was taken seriously even though he had made his burlesque "so broad and so perfectly palpable that even a one-eyed potato could see it."

At the end of "A Couple of Sad Experiences," Twain announces that he does not intend to answer the farmers' questions, noting that earlier in his career he would have attempted to do so. He then refers the reader to "the narrative of my one week's experience as an agricultural editor" to be published in the next issue of *Galaxy* (the one for July 1870).

The last word in the title of the story "How I Edited an Agricultural Paper Once" is significant. The narrator was hired to replace the vacationing regular editor, who was forced to cut his vacation short because the narrator made a curiosity of himself and of the paper by publishing ridiculously inaccurate statements about agriculture in the only issue of the paper he was allowed to edit.

These statements include the observation that turnips grow on trees. When an old man notes that this statement is in error, the narrator claims that the statement was figurative and that he knew all along that turnips grow on vines.

In his "editorials," the narrator assumes that guano is a bird, that ganders spawn, that the words "furrow" and "harrow" refer to the same thing, that there is a moulting

season for cows, that clams can be quieted by music (as if they need to be quieted), that buckwheat cakes are planted, that cornstalks should be set out in July this year, and that oyster beds are properly discussed under the heading "Landscape Gardening."

He observes that a pumpkin is a berry that provides better food for cows than a raspberry, that it is an "esculent of the orange family," and that it is a failure as a shade tree.

When the regular editor returns early from his holiday, he fires the narrator, who claims that knowledge is not needed in the newspaper business, that "the less a man knows the bigger noise he makes and the higher the salary he commands." After calling the regular editor various names, including "cornstalk," "cabbage," and "son of a cauliflower," and after implying that peaches grow on vines, the narrator gives his parting shot: "*You* are the loser by this rupture, not me, Pie-plant. Adios." ■

From issue 25, November 2003

A Mark Twain Tale About a Landslide in Nevada

By Stanley P. Anderson, Editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

Mark Twain's story "The Facts in the Great Land-Slide Case," first published in the Buffalo *Express* on April 2, 1870, and reprinted in collections of Twain's works, including *Mark Twain: Collected Tales, Sketches, Speeches, & Essays, 1852–1890*, edited by Louis J. Budd (pages 345-349), begins with a description of how landslides occur in Nevada. Twain says that the landslides begin when "the warm surface-earth" on the very high, very steep mountains near Carson, Eagle, and Washoe Valleys becomes moist and soft after snow begins to melt rapidly in the spring. Whole mountainsides are removed and deposited in the valleys, and "a vast, treeless, unsightly scar" is left on the front of the mountains.

The "case" is a trumped-up one designed as a practical joke on General Buncombe, a newly arrived U.S. Attorney. The General is hired by Dick Sides (the supposed plaintiff), who owns a ranch on the edge of a valley in "Washoe District." The supposed defendant is Tom Morgan, who owns a ranch on the mountainside directly above Sides' ranch. When Sides hires General Buncombe, he claims that a landside has moved all of Morgan's ranch, including barns, cabins, fences, cattle, and soil ("solid clouds of dust") from the mountainside and deposited it right on top of Sides' ranch, the soil covering it to a depth of about 6 feet. According to Sides, Morgan claims that he still owns the repositioned ranch, even though it is now on top of Sides' ranch, and so he refuses to leave. Sides claims that Morgan is a trespasser.

The courts are out of session, so former Governor Roop, who is in on the joke, is appointed to referee the case. Though all of the testimony, including that of the witnesses called by Morgan's lawyer, favored plaintiff Sides, Roop argues that the repositioning of Morgan's ranch was an act of God that is not to be questioned in court, that God created the ranches and is free to rearrange them as he sees fit. Roop's verdict is that Sides "has been deprived of his ranch by the visitation of God! And from this decision there is no appeal."

That night, General Buncombe begs Roop to modify his verdict. Roop acts as though he is reconsidering the matter, pacing the floor for $2^1/_2$ hours as he does so, and then announces his modification. He says that Sides still has title to the ranch underlying Morgan's new ranch and has "a right to dig it out from under there." General Buncombe is stunned first by the original verdict and then by this modification. Two weeks pass before he realizes that he has been had.

A slightly revised version of this story is included as chapter XXXIV in *Roughing It* (1872). In this version, the name of the plaintiff is changed from Dick Sides to Dick

Hyde and the description of how General Buncombe came to realize that he was the victim of a practical joke is expanded: “At the end of two months the fact that he had been played upon with a joke had managed to bore itself, like another Hoosac Tunnel, through the solid adamant of his understanding.”

Also, the depth of the defendant’s repositioned ranch over the plaintiff’s property is changed from 6 feet to 38 feet. The tall tale got taller. ■

From issue 30, February 2005

Stan Anderson Does Not Retire

By Stanley P. Anderson, Editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

After more than 30 years of distinguished Federal service, Stan Anderson, editor, NRCS, National Soil Survey Center, Lincoln, Nebraska, has announced that he will not retire. “Sometimes, it’s not what you do but what you don’t do that’s important,” Stan said in an exclusive interview. He added, “When I heard of the retirements of Maury Mausbach, Jim Ware, Earl Lockridge, and Rick Bigler, I had to resist the temptation to follow the monkey principle.” When asked to define this principle, he said, “Monkey see, monkey do.”

Stan Anderson at the beginning of his career. This picture was included in a 1974 issue of an SCS magazine celebrating the 75th anniversary of the National Cooperative Soil Survey. Note the crude editing instrument in Stan’s left hand. Also note the cool sideburn.

Stan began his Federal career in 1974, when he joined the Soil Survey Editorial Staff in Hyattsville, Maryland. In 1976, he was transferred to the Midwest Technical Service Center in Lincoln, Nebraska. He has remained in Lincoln to the present day, despite a baffling series of reorganizations. These included consolidation of all soil survey editors in Maryland; dispersal of the editors to the four TSCs (or NTCs) in Portland, Ft. Worth, West Chester, and Lincoln; consolidation of the editors in Lincoln; and dispersal of the editors to various MO offices. Stan says that he does not expect to be around for the next consolidation.

Robert Ahrens, Director of the National Soil Survey Center, is said to be devastated by Stan’s nonretirement.

Stan earned a B.A. degree in English at the University of Minnesota in Duluth and M.A. and Ph.D. degrees in English at the University of Maryland (home of the Terrapins, a.k.a. Terps). When asked how his years in graduate school affected his career as a soil survey editor, Stan exclaimed, “Go Terps!” There may be a hidden meaning in this apparently unresponsive exclamation, which could be considered a veiled reference to soil in*terp*retations.

Stan is married to Janet Shell Anderson, a retired lawyer. Stan and Janet have been married since 1968. They have three sons—Robert, Michael, and Joseph. Speaking on condition of anonymity, Janet has indicated, “I expect to enjoy every moment of Stan’s nonretirement.” ■

From issue 37, November 2006

Nonretirement of Stanley P. Anderson: A Reprise

Stan Anderson, Editor, NRCS, National Soil Survey Center, has once again decided not to retire. The last time that Stan's nonretirement was announced was February 2005, in issue 30 of the NCSS Newsletter.

"If they want to get rid of me, they'll have to throw me out," Stan said in an exclusive interview in which he muttered to himself.

The list of people who are disappointed by Stan's decision is too long to reproduce in the NCSS Newsletter, even if an entire issue is devoted to the list of these people's names (and only their names).

Dr. Robert Ahrens, Director of the National Soil Survey Center, is considering taking up a collection from the people referred to in the previous paragraph, hoping to raise enough money for an attractive buy-out offer.

In the meantime, Stan plans to stay around for as many years as the number of times he is reiterated in the following illustration:

From issue 31, May 2005

Language Matters

By Stanley P. Anderson, Editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

I was saddened to learn that Phil Chavez, formerly an editor for NRCS (SCS in his time), died of cancer on April 24. Phil was working as a supervisory editor on the Soil Survey Editorial Staff in Hyattsville, Maryland, when I joined the staff in June 1974. He was a talented editor with a great sense of humor.

Another supervisor on the editorial staff in 1974 was Thelma Finlay. Thelma was my boss. She died of cancer on December 14, 1981, the day Joseph, my youngest son, was born. Phil visited her at the hospice where she was staying in her final days. After a time, she told him that he would have to leave. She was getting tired, and she had to use the bedpan. As he was walking out the door, she asked, "Bedpan—is that one word or two?" ■

From issue 34, February 2006

Language Matters

By Stanley P. Anderson, Editor, National Soil Survey Center, NRCS, Lincoln, Nebraska.

I value concise writing. My motto is, "Say it once, just once, only once, and be done with it." The way this motto is expressed shows that you can be brief at the same time that you are redundant. ■

From issue 44, August 2008

A Blast From the Past

By Stanley P. Anderson (a.k.a "Columbo), Editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

Note the following from page 29 of the current online GPO Style Manual (2000)—**3.29**. In soil science the 24 soil classifications are capitalized.

Alpine Meadow Bog Brown

From page 57 of the same document, more on capitalization—

soil classifications:

Alpine Meadow
Bog
Brown
Chernozem (Black)
Chestnut
Desert
Gray-Brown
Podzolic
Half Bog
Laterite
Pedalfer
Pedocal
Podzol
Prairie
Ramann's Brown
Red
Rendzina
Sierozem (Gray)
Solonchak
Solonetz
Soloth
Terra Rossa
Tundra
Wiesenboden
Yellow

These names are similar to but not identical with those in the classification systems in two USDA publications—C.F. Marbut's "Soils of the United States" (1935), which is Part III of *Atlas of American Agriculture*, and "Soil Classification," by Mark Baldwin, Charles E. Kellogg, and James Thorp, in *Soils and Men*, 1938 Yearbook of Agriculture.

The first time that soil names appear in a GPO Style Manual is in the 1935 edition. The list in this edition is nearly the same as that in the 2000 edition, but the name "Chernozem" is not followed by the parenthetical word "Black" and "Half Bog" is hyphenated. Also, the "rule" reads as follows: "Terms used in soil science for names of the 24 great soil groups are capitalized."

Editions of the GPO Style Manual that are relevant to this question were published in 1933, 1934, 1935, 1937, 1939, 1945, 1953, 1959, 1962, 1967, 1973, 1984, and 2000. I was able to check all of these editions, except for the 1962 one, to determine when the three minor alterations described in the previous paragraph were made. I assume that all three of the changes were made at the request of soil scientists at the headquarters of the Soil Conservation Service.

The three changes first appear in the 1945 edition: "Half Bog" is no longer hyphenated, "Chernozem" is changed to "Chernozem (Black)," and the "rule" is

changed to read, “In soil science the 24 soil classifications are capitalized.”

One additional change appears in the 1984 edition. The term introducing the 24 names is changed from “soil names” to “soil classifications.” I do not know what prompted this alteration. Making this minor change as late as 1984 is like straining at gnats and swallowing elephants.

I wrote an email to the GPO Style Board in which I asked that the “24 soil classifications” be replaced by our current soil orders (the 12 “sols”) if soil names are listed at all. After informing me that my request was “very timely” because a new edition will be out in late 2008 or early 2009, Michael Abramson, the “Foreperson/Style Board Chairman,” asked me whether the 12 names are “orders” or “classifications.” I told him that the names I specified are orders. I assume that they will be identified as such.

I had given the board the option of deleting all references to soils from the manual, since there is no great need to point out that “Alfisols” and the other coined proper nouns that serve as the names of soil orders are always capitalized. In his response, Mr. Abramson ignored this option. After 73 years (1935-2008), he apparently did not want a divorce. ■

From issue 51, May 2010

12 Soil Orders in the 2008 GPO Style Manual

By Stanley P. Anderson, Editor, USDA, NRCS, National Soil Survey Center, Lincoln, Nebraska.

The latest GPO Style Manual lists the 12 orders of the current U.S. soil taxonomic system. This is the first time that the orders have been included in a GPO Style Manual. In the previous editions, “soil classifications” or “great soil groups” were listed, even when they were outdated. For the 12 orders, see chapter 4 of the 2008 manual:

http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2008_style_manual&docid=f:chapter4.pdf.

Go to “soil orders” (page 72 of the book and page 30 of the PDF file).

Also see chapter 3:

http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2008_style_manual&docid=f:chapter3.pdf.

Go to 3.29 (page 35 of the book and page 9 of the PDF file).

For the role of NRCS in substituting the names of the current soil orders, see: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2008_style_manual&docid=f:chappre.pdf.

On page 6, note the first item on the list of the Acknowledgments.

Also see “A Blast From the Past” on page 3 of Issue 44 of the NCSS Newsletter (August 2008):

ftp://ftp-fc.sc.egov.usda.gov/NSSC/NCSS/Newsletters/issue44.pdf. ■

From issue 45, November 2008

New Edition of the *Keys to Soil Taxonomy* Planned

By Stanley P. Anderson, Editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

The National Soil Survey Center plans to publish a new edition of the *Keys to Soil Taxonomy* in 2009. In preparation for this publication, Craig Ditzler and I asked John Kelley, Soil Data Quality Specialist, MO 14, Raleigh, North Carolina, to take pictures of soils with lamellae for use on the cover. John sent us a few, and we picked one. The next day, he sent me a more personal picture from the same site for consideration. I cropped this new picture and otherwise slightly modified it, creating the impression of a human figure embedded in the soil (fig. 1).

Removing a little more of the anthropological detail creates a different impression (fig. 2), one in which the human figure appears to be behind the soil, as if he were on the other side of a hill. In figure 3, the figure is in front of the soil.

Figure 1.—Lamellae in an anthropogenic soil.

Figure 2.—Peering over the horizon

Figure 3.—John Kelley.

From issue 46, February 2009

Prairie Chickens in Soil Surveys

By Stanley P. Anderson, Editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

In the fall of 1985, I received a speed memo from John Doll, Soil Scientist, SCS State Office in Illinois, asking my opinion of three pictures of prairie chickens that were being considered for inclusion in the soil survey of Jasper County, Illinois. One of the pictures was not suitable for publication, but the other two, taken by Tom Ulrich, a professional photographer, were really good. Part of my response to John's memo is as follows:

> I think we should use the two pictures taken by the professional (the male booming and the two males fighting). Credit can be given in the caption ("Photo courtesy of..."). A possible caption for the two pictures is, "Typically, the male prairie chicken is interested in sex and violence."

I do not know why the pictures were not included in the survey when it was published in 1992. The section "Wildlife Habitat" includes a paragraph about prairie chickens, where the pictures could have been referenced (with or without my suggested caption).

In 1999, I asked Bob McLeese, State Soil Scientist in Illinois, if he had any "quotable quotes" about the National Cooperative Soil Survey that I could include in the NCSS Newsletter in honor of the NCSS Centennial. Bob's response included the 1985 speed memo in which John Doll and I had communicated about the pictures of prairie chickens. Bob attached a note saying, "You can run but you can't hide." John must have kept the memo for 14 years.

A male prairie chicken booming. Photo by Tom Ulrich.

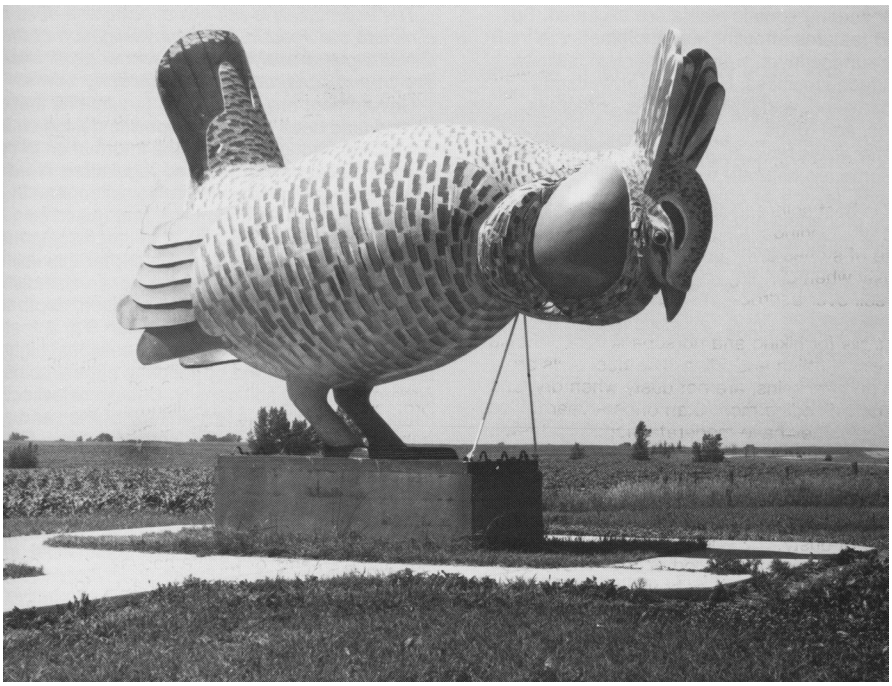
Two male prairie chickens in combat. Photo by Tom Ulrich.

The following passage is from the section “Wildlife Habitat” in the *Soil Survey of Jasper County, Illinois* (1992):

> The Jasper County Prairie Chicken Sanctuary is in an area...west of Newton. The goal in managing this sanctuary is to ensure the survival of one of the remaining populations of prairie chickens in Illinois. The prairie chicken, which at one time was abundant in Illinois, is a grassland grouse and a distant relative of the quail and pheasant. It requires large areas of undisturbed grassland for nesting and adequate food and cover. A hen prefers to nest in a grassy area that has an abundance of dried vegetation left over from the previous year. The area should provide cover that is open enough to allow easy movement and should have a good supply of insects, which are the primary food for the chicks. Redtop, timothy, and small grain should be included in the area. Meadows of clover are not good nesting sites. Mowing should be delayed until July. Adequate cover should be maintained throughout the winter, when the diet of the prairie chickens consists mainly of waste grain and weed seeds.

At some point in the 1980s, the Minnesota State Staff sent me a picture of a large statue of a prairie chicken in a rest area in Wilkin County, Minnesota. The staff wanted to know what section of the survey was most appropriate for the picture. I lobbied for the cover, but that suggestion was rejected, so I then suggested that the picture could be included in the “Wildlife Habitat” or “Recreation” section, depending on how you look at it. The picture and the following paragraph were eventually included in the section “Wildlife Habitat” in the *Soil Survey of Wilkin County, Minnesota* (1989):

> Wilkin County has a number of Nature Conservancy preserves. These include Western Prairie, Town Hall Prairie, Kettle Drummer Prairie, and Foxhome Prairie. These areas are inhabited by some of the remaining prairie chickens in the valley prairie area. During the mating season, the



A large reproduction of a booming prairie chicken in a roadside rest area near Rothsay, in Wilkin County, Minnesota.

> prairie chickens are on these booming grounds. The male birds fan their tails, display erect feathers on their necks, and inflate orange skin sacs at the sides of their necks. These sacs serve as resonating chambers that produce a hollow booming sound that can carry as much as a mile.

A poem entitled "Booming grounds" was published in the journal *Prairie Poetry* in 2006. It can be accessed online (http://www.prairiepoetry.org/poetry06/poems/andersons1.html). ■

From issue 48, August 2009

Language Matters

By Stanley P. Anderson, Editor, National Soil Survey Center, Natural Resources Conserevation Service, Lincoln, Nebraska.

Back in the day when we started to generate soil survey tables out of Iowa State University (about 1975), we had to coin some terms for soil limitations because we were limited to 13 characters per limitation. If we exceeded 13 characters, the description would take up more than one line and wrapping problems would occur in these computer-generated tables. The coined terms included "percs slowly" (my personal favorite at 12 characters), "shrink-swell" (at 12 characters without the word "potential"), and "cutbanks cave" (13 characters). These terms encouraged soil survey authors to write the following kind of monstrosities, as if the coined terms were nouns:

This soil is limited for septic tank absorption fields because of percs slowly.

This soil is limited for buildings because of shrink-swell.

This soil is limited for shallow excavations because of cutbanks cave.

We have since changed "percs slowly" to "restricted permeability" and "shrink-swell" to "shrink-swell potential" and have managed to cope with the resulting wrapping problems. Until recently, we left the term "cutbanks cave" alone, as if it were free of errors. In fact, there are two problems with the term. One is the word "cutbanks," and the other is the word "cave." The definitions of "cutbanks" I have found indicate that the word describes natural cutting by streams. GOG, for example, defines a cutbank as "a steep bare slope formed by lateral erosion of a stream." So, when we invented "cutbanks cave," we applied the word "cutbanks" to excavations and hoped that our meaning would be clear because of the column heading (e.g., "Shallow excavations"). Our definition of the term perhaps points to the problem with the word "cave":

Cutbanks cave. The walls of excavations tend to cave in or slough.

This definition indicates that the process can include caving or sloughing. We did not have room to add "or slough" to the term when we invented "cutbanks cave," but we are now free to describe all limitations more accurately. At the National Soil Survey Center, Bob Dobos and I agreed on what we consider a suitable alternative that consists of 25 characters (including spaces): unstable excavation walls. In the national interpretations, this is the way the limitation will be described in the column "Shallow excavations" and in other columns that involve digging holes in the ground. The new term lacks the poetry of the alliterative "cutbanks cave" but is more accurate. ■

From issue 49, November 2009

The Romeo and Joliet Series

By Stanley P. Anderson, Editor, National Soil Survey Center, Natural Resources Conservation Service, Lincoln, Nebraska.

Both of these series were established in Will County, Illinois, the Romeo series in 1912 and the Joliet series in 1951. The Romeo series was named after what is now Romeoville, Illinois, and the Joliet series was named after what is now Joliet, Illinois. The two series share the same taxonomic classification (figs. 1 and 2). The Romeo soils are very shallow, and the Joliet soils are shallow. According to Bob McLeese, Illinois State Soil Scientist, the two series have never been mapped in complex with one another, at least not in Illinois.

The history of the names of the places after which the two series are named is described in *Legends of America*, "Romeo and Juliet of the Illinois Plains: Romeoville and Joliet" (http://www.legendsofamerica.com/IL-RomeoJoliet.html):

> Romeoville, Illinois, some 30 miles southwest of Chicago, was first called Romeo when nearby Joliet was still called "Juliet." At this time, the settlement was a twin and rival community of Juliet, unlike the romantic pair of Shakespeare's era. Founded in the 1830's, the area was home to abundant farmlands and stone quarries. A post office was established on October 29, 1833.
>
> In 1845, the city of Juliet's name was changed to Joliet to honor the famous explorer Louis Jolliet. When this happened, Romeo acknowledged the busted romance by becoming "Romeoville."

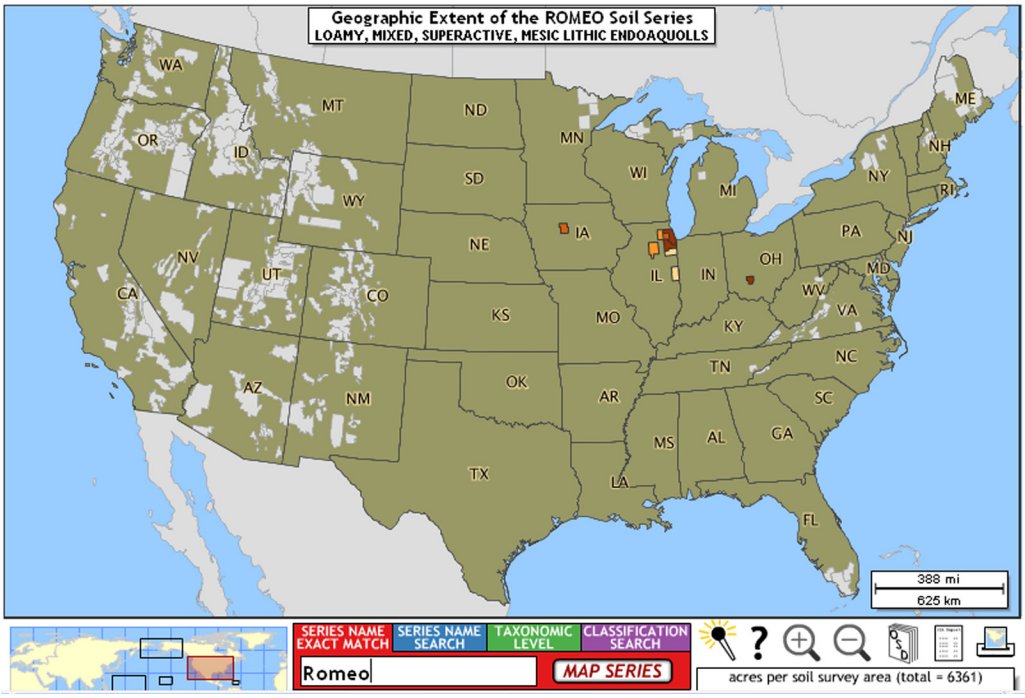


Figure 1.—The geographic extent and taxonomic classification of the Romeo series.

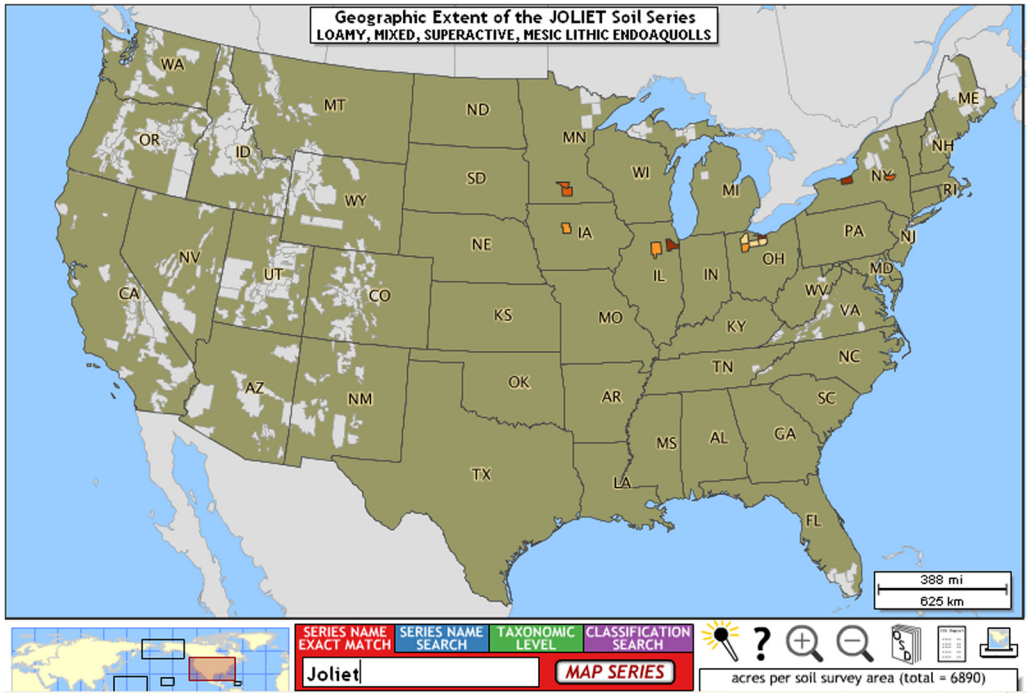


Figure 2.—The geographic extent and taxonomic classification of the Joliet series.

The village of Romeoville is less than 10 miles north of the city of Joliet. ■

From issue 52, August 2010

Yield Sign in Wadena, Minnesota

By Stanley P. Anderson, editor, Natural Resources Conservation Service, National Soil Survey Center, Lincoln, Nebraska.

On the way up to northern Minnesota in July, I stayed at a motel in Wadena, Minnesota. My wife and I viewed the damage caused by the Wadena tornado on June 18, 2010. One of the points of interest was a severely bent Yield sign in an open area between the ice-skating rink and the municipal swimming pool, both of which were significantly damaged by the tornado.

My father taught agriculture at Wadena High School during the period 1958 to 1963, and I graduated from there in 1962. All five of the homes in which my family lived from 1958 to 1963 were spared. The first one was less than five blocks from the path of the tornado indicated by the bent sign.

Damage from tornado in Wadena, Minnesota, on June 18, 2010. Picture taken on July 17, 2010. The sign appears to have followed its own instruction. ■

From issue 55, May 2011

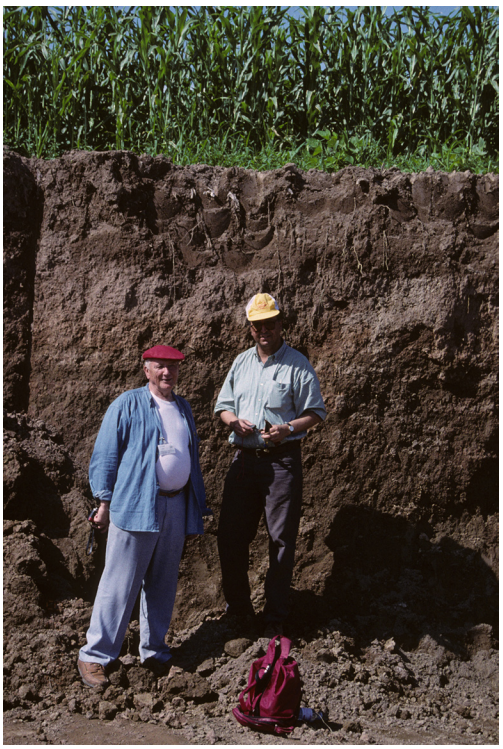
Dr. Arnold Features a Red Cap

By Stanley P. Anderson, editor, NRCS, National Soil Survey Center, Lincoln, Nebraska.

NSSC editor Jennifer Sutherland and I are preparing Dr. Richard Arnold's extensive collection of papers for presentation on the Web. I searched for suitable pictures in a gallery Gary Muckel assembled years ago (unfortunately without captions). I found a number of pictures of Dr. Arnold in his red cap, six of which are reproduced on pages 8 and 9. Gary Muckel is in the second picture on page 9, as is Horace Smith.

Dr. Arnold wrote me the following about the top two pictures on page 8:

> An interesting sidelight about two of the pictures where I have a partly unbuttoned blue shirt. Hari Eswaran and I went to a soil meeting in Urumqi, a city in the far northwest of China. The meeting was about soils of arid lands. My suitcase did not arrive from Beijing and I had a pair of dress trousers, my red field cap, and one change of underwear. I was washing out clothes each night in a bathtub and the extremely low humidity meant that I had dry clothes the next day. Finally one of the younger guys from Nanjing Soil Institute took me shopping for clothes. Well, guess what—my body shape was not right for any work clothes but we found a box under a table with old men's pants (wool, not denim or other cotton - ugh) and they buttoned instead of a zipper. Then after a long search we found a blue cotton shirt that almost went around me. And as I was a monitor at one soil site there I was leading the discussion. The other pic with those nice clothes was in a large quarry where they excavated the soil to use in construction and we were discussing the layering of sediments at that site.
>
> When we finally got back to Beijing I asked about my luggage. It had been sent to Urumqi and actually was at that airport all the time of the



meeting, so they phoned out and had it brought back to Beijing. I had clean clothes for my meetings there for several days before we returned home. Such are the “stories” of other times, other places.

Dr. Arnold also commented about his red cap(s):

Believe it or not, I still have a few red caps and I often wear one when out working in our yard. Over the years I gave away quite a few and so had to keep looking for more, but I loved them as a means of recognition. It all started when Al Southard and I were grad students at Cornell and we bought our first red hats at a street sale in Gloversville, NY, while working on soil survey there. That was probably 1958. Here in Indiana red is the color of the University of Indiana and so Purdue fans do not look favorably at me when I wear the cap in town.

Dr. Arnold’s comment about the last picture:

... the last one is in the Swiss mountains. We were on a post Soil Congress tour after being in Hamburg, Germany, and several stops were in Switzerland. At this height they were studying the weathering of cloth samples. They were put in special containers and they dug them up from time to time to see what damage the microbial populations were doing. This is a beautiful glaciated landscape with a small town and lake in the valley below.

Another comment by Dr. Arnold sheds light on the extent and nature of the papers we are collecting:

I have just finished typing up notes I transcribed from tapes I made at the Soil Congress in Madison, WI, in August 1960. That was the one where Guy Smith and others presented the 7th Approximation of Soil Taxonomy to the world. I have them ready to send to Jenny. It was my first contact with Russian soil scientists and in 2010 I was once again in Russia giving several lectures about sustainable ecosystems and the role of soils. The soil survey has truly been an exciting, challenging, and satisfying career for me. ■

Articles

Soil Sampling by the Lewis and Clark Expedition

Stanley P. Anderson[1]

President Thomas Jefferson's instructions to Meriwether Lewis, Captain of the Lewis and Clark Expedition (1803–1806), lists various "objects worthy of notice" by the members of the expedition. Among these are "the soil & face of the country, it's growth & vegetable productions, especially those not of the U.S." (Jackson, vol. 1, p. 63). A letter from Lewis to Jefferson written in Cincinnati on October 3, 1803, indicates the kind of soil sample that Lewis thought appropriate to send to the President (Jackson, vol. 1, p. 126–131).

Sample from Big Bone Lick

Lewis had stopped to rest his crew for a few days and decided to take a side trip by land to Big Bone Lick (a trip of 17 miles by land and 53 miles by water). The lick is in what is now Boone County, Kentucky (Fig. 1). Buried at this site were huge bones of mammoths and other creatures that, while seeking salt centuries earlier, had become mired in mud and died. Lewis visited with Dr. William Goforth, a Cincinnati physician who in May of 1803 had dug some of the bones from "a pitt 30 feet square and eleven feet in debth in a moist part" of the lick and from "a small pitt, sunk in the dryer part of the Lick." Goforth showed Lewis "two handsome specimens," both from the moist part of the lick. The first was the grinder of what Lewis calls an elephant, and the second was the grinder of a mammoth. The first grinder weighed 10 1/2 pounds. The mammoth's tooth had not yet been weighed. Its roots were attached to "a lump of clay." After Goforth agreed to let Lewis ship the mammoth's tooth and selected bones to Jefferson, Lewis decided to leave the clay attached during shipment because it "will not only guard the tooth from injury in transporting it, but will at the same time furnish a good specimen of the earth of which the lick is formed."

So, a lump of clay attached to the tooth of a mammoth was Lewis's idea of a good soil sample and the catch-as-catch-can means by which it was acquired was his method of soil sampling.

The specimens never reached Jefferson. They were lost at Natchez either because the boat carrying them sank at a landing (Jackson, vol. 1., p. 132, note 6) or because deliberate actions were taken to destroy the boxes con-

[1] Editor, USDA-NRCS-NSSC, Federal Building, Room 152, Mail Stop 33, 100 Centennial Mall North, Lincoln, NE 68508-3866 (stan.anderson@nssc.nrcs.usda.gov).

Fig. 1. Part of map sheet 47 in the *Soil Survey of Boone, Campbell, and Kenton Counties, Kentucky* (USDA, SCS, 1973). Big Bone Lick State Park is the delineation with the white background. The map symbols in this delineation are No (Nolin silt loam), Eg (Egam silty clay loam), and Nk (Newark silt loam). The large river in the lower left-hand corner is the Ohio. The date of the map is 1971.

taining the specimens. These actions are described by Hore Browse Trist in a letter to Jefferson dated March 6, 1804 (Jackson, vol. 2, p. 687–688):

> Unfortunately however the owner of the Boat in which they were sent, on his arrival at Natchez, was put in prison, and in consequence of his giving no information to any person relative to the Boxes, two of them were sunk in the river, & the third broken open, & the contents stolen or destroyed.

Jefferson was interested enough in the bones to have Clark supervise an excavation at the lick in 1807, on his way to St. Louis, where he was to be superintendent of Indian affairs. Clark sent the President a number of the bones (Jackson, vol. 1, p. 131). The President referred to these bones in a letter dated July 14, 1808 (Jackson, vol. 2, p. 442).

Newark, Nolin, and Egam soils are delineated at the lick in the *Soil Survey of Boone, Campbell, and Kenton Counties, Kentucky* (1973). These soils are on flood plains. The Nolin and Newark soils have a fine-silty control section, and the Egam soil has a fine-textured control section. The Nolin soil is well drained, the Egam soil is moderately well drained, and the Newark soil is somewhat poorly drained. The mammoth's tooth was excavated from what Lewis calls "a moist part of Big Bone Lick." The soil in the pit from which the tooth and the attached lump of clay were extracted was probably Newark silt loam (map symbol Nk in Fig. 1) or a poorly drained soil included in the delineation of the Newark soil at the lick.

Other Samples

Just before setting off from Fort Mandan for the West Coast in April of 1805, Lewis and Clark sent to Jefferson (by way of St. Louis) numerous specimens of plants, animals, soils, and minerals and other items collected on their trip up the Missouri River the previous year. Among these items were 67 or 68 soil and mineral specimens. Jefferson sent these to the American Philosophical Society in Philadelphia. What Lewis called "a Petrified Jawbone of a fish or some other animal" is the only one of the 67 or 68 items that has survived. Also available are Lewis's notes about the items (Moulton, vol. 3, p. 473–478; Jackson, vol. 1, p. 231–242). The size of the samples is indicated by the fact that they were all packed into one box, which Jefferson described as small and which was not opened until it arrived in Philadelphia (Jackson, vol. 1, p. 235, 239, 254, 260, 263, 264, and 269).

On September 20, 1804, at the beginning of the Big Bend of the Missouri in Lyman County, South Dakota, Lewis preserved a "specemine" from "a clift of black porous rock which resembled *Lava* tho' on a closer examination I believe it to be calcarious and an imperfect species of the French *burr*" (Moulton, vol. 3, p. 95). This specimen cannot be tied with certainty to any of the 67 or 68 items sent from Fort Mandan.

Eleven of the items can be considered soil samples (2, 6, 10, 11, 15, 21, 28, 41, 45, 47, and 48), judging by Lewis's brief descriptions of them and by the even briefer descriptions by Adam Seybert, a physician, scientist, and member of the American Philosophical Society who added comments when

the items were received in Philadelphia. These descriptions are as follows (Seybert's comments are in italics and are bracketed):

2. Found just above the entrance of the cannon Ball river, the butte[e] is principally composed of this sand & strongly impregnanted with <a Substance supposed to be blue vitriol> [*Sulphat of Iron in consequence of the decomposition of Pyrites.*]
6. Augt 21, 1804 In the interstices of a blue clay which forms the majority of the bluffs, Strata of all earth or Stone make their appearance & Horizontal. [*Alum formed in consequence of a decomposition of aluminous Shistus—& Sulfate of Lime on the lower surface crystallized.*]
10. A Specimen of Earth which forms a narrow Strata in the Bluffs above the Sand rock & beneath a large Strata of blue earth Augt 22, 1804— [*Tripoli, nearly colourless & shistose.*]
11. Generally met with in the Surface of the earth in the level plains & is very common from the calumet Bluff to Fort mandan [*Clay with aluminous impregnation derived from decomposed Shistus.*]
15. Sept. 1, 1804. found exuding from a Strata of firm blue earth which forms the majority of the River Bluffs— [*a yellowish clay, probably arising from decomposed Slate.*]
21. A specimen of a firm blue Earth which formed a large Strata of the Bluffs which we passed from 21 Augt. to 15 Sep 1804 [*Aluminous Shistus in a state of decomposition.*]
28. *Green Earth*, Presented by Mr Charbono, who informed me that the natives procure this earth in the neighberhood of the Rocky mountain, but cannot <find> point out the place.— The Indians mix this Earth with glue & paint their arrows with it, when thus boiled with Glue it gives a fine green color to wood, but easily yield to Water the Indians also paint their Skins with it. M.L: Feby. 13, 1804 [*Green Clay coloured by Iron.*]
41. Specimen of Earth which constitutes the majority of the Bluffs—23d Aug 1804 when taken was in a firmer state than at present— [*Slate decomposed with Pyrites decomposed.*]
45. Specimen of the Earth which forms the base of the Banks of the Missouri H.[*fine grey coloured Sand.*]
47. Specimen of the Earth of which the Hills of the Missouri are principally formed from the entrance of the river Sioux to fort mandan & if Indian information may be depended upon, for several hundred miles further up— It is in this tract of country that the Missouri acquires it coloring matter of which it abates but little to its junction to the Mississipi. This earth when saturated by the rains or melting snows becomes so Soft for so many feet in depth, that being unable to support its own weight, it Seperates into large masses from the hills, & Slipping down their Sides precipitates itself into the Missouri & mingles with its waters— great quantities of this earth are also thrown into the river by its Subsidiary Streams & rivulets which pass thro' or originate in this tract of open Country. M. L. [*Slate in a decomposed state.*]

48. Sep 10th found on the side of the Bluffs not very abundant [*same as 47—with streaks of green clay.*]

These descriptions indicate Lewis's intention to typify the soils on the various parts of the landscape along the Missouri, including the buttes (number 2), the bluffs and hills (numbers 6, 10, 15, 21, 41, 47, and 48), the plains (number 11), and the banks (number 45).

The "firm blue earth" referred to in Descriptions 15 and 21 can be related to Clark's journal entries for the period August 21 to September 15, 1804, from the mouth of Floyd River in Sioux City to the mouth of the White River in Chamberlain, SD. Clark observed what appeared to be this kind of material at five points along this stretch of the Missouri:

1. August 24—A "blue clay Bluff of 180 or 190 feet high" (Moulton, vol. 2, p. 505). This is what later became known as the "Ionia Volcano" in Dixon County, Nebraska, though it is really not a volcano. (Clark said, "Those Bluffs appear to have been laterly on fire, and at this time is too hot for a man to bear his hand in the earth at any debth, gret appearance of Coal.")
2. August 25—A "Bluff of blue earth" (Moulton, vol. 2, p. 8); also called "a Bluff of Blue Clay" on p. 11. This is about 1 mile east of Vermillion, SD.
3. August 26—A "Clift of White & Blue or Dark earth" (Niobrara Chalk over Carlile Shale, according to Moulton, vol. 2, p. 14–15). This is at a site between the Vermillion and James Rivers.
4. September 4—A "Bluff of bluish Clay" (Moulton, vol. 2, p. 46–47) about 2 miles downstream from the mouth of the Niobrara River in Nebraska.
5. September 5—A "Bluff of Blue earth" (possibly part of what was later known as the Chouteau Bluffs in Charles Mix County, South Dakota, according to Moulton, vol. 2, p. 50–51).

The repeated occurrence of this kind of soil material along this stretch of the river probably prompted Lewis to take samples of the material. It is likely that each of the samples amounted to a handful of soil, about the size of a fragment that a mammoth might pick from its teeth.

References

Jackson, D. (ed.) 1978. Letters of the Lewis and Clark expedition with related documents, 1783–1854. 2nd ed. University of Illinois Press, Champaign, IL.

Moulton, G.E. (ed.) 1987. The journals of the Lewis and Clark expedition. University of Nebraska Press, Lincoln, NE.

United States Department of Agriculture, Soil Conservation Service. 1973. Soil survey of Boone, Campbell, and Kenton Counties, Kentucky.

Prairies as Viewed by the Lewis and Clark Expedition

Stanley P. Anderson[1]

In his book *Undaunted Courage*, Stephen Ambrose noted that most American pioneers associated good-quality soils with hardwood trees and would have regarded the virtually treeless prairies of the Great Plains as poor agricultural land (Ambrose, 1997). Ambrose noted that Meriwether Lewis did not necessarily agree with this view.

While Lewis, and perhaps Thomas Jefferson, reflected dissenting views on this matter, Patrick Gass, who became Sergeant Gass after the death of Sergeant Charles Floyd, appears to represent the conventional view.

Patrick Gass's Capability Classes

On May 27, 1805, the expedition was in what is now Fergus County, Montana, as it traveled through the Missouri River Breaks, which Gass characterized as "a country which presents little to our view, but scenes of barrenness and desolation." Noting that the expedition has traveled "by the course of this river" nearly 2,300 miles, Gass said that "it may not be improper to make two or three general observations respecting the country we have passed" (Moulton, 1987, vol. 10, p. 94). These observations divide the land from St. Louis to the Missouri River Breaks into three classes, which I call Class I, Class II, and Class III.

Class I

Gass noted that this land extends about 600 river miles, from the mouth of the Missouri River to the mouth of the Platte River. It "is generally of a good quality, with a sufficient quantity of timber; in many places very rich, and the country pleasant and beautiful" (Moulton, 1987, vol. 10, p. 94).

Class II

Gass asserted that from the mouth of the Platte to the Missouri River Breaks (a distance of more than 1,500 river miles), "the soil is less rich, and except in the bottoms, the land of an inferior quality," adding, however, that it "may in general be called good second rate land" (Moulton, 1987, vol. 10, p. 94). Gass associated the relatively inferior quality of the land with a scarcity of trees:

> Along the Missouri and the waters which flow into it, cotton wood and willows are frequent in the bottoms and islands; but the upland is almost entirely with-

[1] Editor, NRCS, National Soil Survey Center, Lincoln, NE (stan.anderson@nssc.nrcs.usda.gov).

> out timber, and consists of large prairies or plains the boundaries of which the eye cannot reach. The grass is generally short on these immense natural pastures, which in the proper seasons are decorated with blossoms and flowers of various colours (Moulton, 1987, vol. 10, p. 94).

Class III

Gass characterized this land as a bare, rocky, desolate, sterile, mountainous desert. It is "the most dismal country I ever beheld; nothing but barren mountains on both sides of the river, as far as our view could extend." He saw "no encouraging prospects" that the quality of the land will improve as the expedition travels westward (Moulton, 1987, vol. 10, p. 95). This prediction turned out to be incorrect, for Gass later found various fertile areas between the Missouri River Breaks and the Pacific Ocean, such as Weippe Prairie in Clearwater County, Idaho. He called this prairie "a beautiful rich plain" (Moulton, vol. 10, p. 147). The only areas that he found to be as infertile as the Missouri River Breaks were in the mountains along the Lolo Trail in Idaho. He referred to these areas as "high desert mountains," "this horrible mountainous desert," and "these dismal and horrible mountains" (Moulton, vol. 10, p. 143–146). These mountains appear to qualify as Class III land.

Lewis and Jefferson

Unlike Gass, Lewis thought that the virtual treelessness of the prairies was the result of fires set by the Indians and was not to be regarded as evidence of poor soil quality. His views are most clearly expressed in a letter sent from Fort Mandan to his mother on March 31, 1805. The key passage in this letter is in the second paragraph:

> This immence river so far as we have yet ascended, waters one of the fairest portions of the globe, nor do I believe that there is in the universe a similar extent of country, equally fertile, well watered, and intersected by such a number of navigable streams. The country as high up this river as the Mouth of the river Platte, a distance of 630 miles is generally well timbered; at some little distance above this river the open or prarie country commences (Jackson, 1978, vol. 1, p. 223).

Lewis added that he was "agreeably disappointed" by this prairie country:

> From previous information I had been led to believe, that it was barren, steril and sandy; but on the contrary I found it fertile in the extreem, the soil being from one to 20 feet in debth, consisting of a fine black loam, intermixed with a sufficient quantity of sand only to induce a luxuriant growth of grass and other vegitable productions, particularly such as are not liable to be much injured, or wholly destroyed by the ravages of the fire. It is also generally level yet well watered; in short there can exist no other objection to it except that of the want of timber, which is truly a very serious one (Jackson, 1978, vol. 1, p. 223–224).

Lewis attributed the scarcity of timber to the "ravages of fires" rather than to inferior soil quality:

> This want of timber is by no means attributeable to a deficiency in the soil to produce it, but ows it's orrigine to the ravages of the fires, which the natives kindle in these plains at all seasons of the year. The country on both sides of the river, except some of it's bottom lands, for an immence distance is one continued open plain, in which no timber is to be seen, except a few detached and scattered copse, and clumps of trees, which from their moist situations, or the steep declivities of hills are sheltered from the effects of fire (Jackson, 1978, vol. 1, p. 224).

For Lewis, the luxuriant prairie grasses and the abundance of deer, elk, buffalo, and other wildlife (described in the third paragraph of the letter to his mother) indicated the fertility of the soils between the Platte River and Fort Mandan. Whereas Gass said that the prairie grass is "generally short," Lewis noted "a luxuriant growth of grass and other vegitable productions." Lewis regarded this "luxuriant growth" as an indicator of good soil quality.

In "Affleunts of the Missouri River," another document written at Fort Mandan in the winter of 1804–1805, Lewis described the streams that flow into the Missouri in the stretch from St. Louis to Fort Mandan. He also evaluated the lands along these streams. He described most of the lands below the Platte River as "fertile" and as "well watered" and "well timbered." The term "well timbered" virtually disappeared from this refrain when he described the lands above the Platte, but he continued to regard most of the soils as fertile and, unlike Gass, did not indicate that they were somehow second rate (Moulton, 1987, vol. 3, p. 335–369). Lewis considered the grasslands to be about as fertile as the forested areas.

Thomas Jefferson's view of the scarcity of timber on the prairies is indicated in his report to Congress on November 14, 1803:

> That part of Upper Louisiana which borders on North Mexico is one immense *prairie*. It produces nothing but grass. It is filled with buffalo, deer, and other kinds of game. The land is represented as too rich for the growth of forest trees (Jefferson, 1803).

The startling last sentence seems more political than scientific, for it tends to justify the Louisiana Purchase, which was attacked by the Federalists, Jefferson's political enemies. Lewis's explanation appears more scientific—fire rather than superior soil quality seems a more likely cause for the scarcity of trees. Also, it seems a more likely cause than the inferior soil quality described by Gass.

In his views of soil quality in the area of the Louisiana Purchase, Jefferson may have been influenced by the French, who tended to view this area as a garden, unlike the English and the Spaniards, who tended to view the area as a desert (Allen, 1975). In a letter to Lewis dated November 16, 1803, Jefferson enclosed "Extracts from the Journal of M. Truteau, Agent for the Illinois trading company," which included the following remarkable sentence: "The soil of the Missouri is the most fertile in the Universe" (Jackson, 1978, vol. 1, p. 138).

One of the purposes of the Lewis and Clark Expedition was to test the validity of such claims and thus determine the suitability of the areas they ob-

served for agrarian settlement. Lewis and Clark objectively observed both gardens and deserts during the expedition and reported those observations in their journals. Lewis's reaction to the prairies of the Great Plains shows the extent to which he was a scientific observer of the landscape. He had heard that the prairies were like deserts ("barren, steril and sandy"), but objective observation showed them to be "fertile in the extreem."

References

Allen, J.L. 1975. Passage through the garden: Lewis and Clark and the image of the American Northwest. University of Illinois Press, Champaign, IL.

Ambrose, S.E. 1997. Undaunted courage: Meriwether Lewis, Thomas Jefferson, and the opening of the American West. Touchstone ed. Simon & Schuster, New York, NY.

Jackson, D. (ed.) 1978. Letters of the Lewis and Clark expedition with related documents, 1783–1854. 2nd ed. University of Illinois Press, Champaign, IL.

Jefferson, Thomas. Description of Louisiana. 8th Congress, 1st Session, November 14, 1803. American State Papers, Class X, Miscellaneous. Vol. 1, p. 346.

Moulton, G.E. (ed.) 1987. The journals of the Lewis and Clark expedition. University of Nebraska Press, Lincoln, NE.

Two Pedologists Approach the Pearly Gates

Written by Stanley P. Anderson on the occasion of Tommy Calhoun's retirement.

Dr. Arnold was relieved to see that he was approaching the Pearly Gates. At least he had a shot.

St. Peter escorted him into the Administration Building and then to a desk in a large classroom. A copy of the Heavenly Application Form sat on top of the desk.

"Just fill out this form, and then we'll talk," St. Peter said. "Be sure to use the number 2 pencil."

Dr. Arnold studied the title of the form. "I hate to quibble at this point, but you might consider rewording this title. It implies that the form is heavenly."

"You're not another one of those editors, I hope. The Boss has instructed us not to let editors pass through the gates. They just cause dissension and unhappiness with all their quibbles about the wording of our hymns."

"Not to worry. I'm a pedologist, a soil scientist."

"Good. We let some of those in, but we don't let them have shovels, 'cause we don't want holes all over Heaven."

"Pedons," Dr. Arnold said. "Those holes are called pedons. That's because…"

"Whatever. Spare me the details. All I know is that a few years ago a bunch of you guys dug holes everywhere. They stood around the holes arguing in a foreign tongue that appeared to be made up of all the languages that were ever used on Earth. The air was filled with such odd utterances as 'Thapto-Histic Cryaquolls.' The Boss said that it was like the Tower of Babel all over again, this time in Heaven, so he forbade digging, put a quota on the number of pedologists to be allowed in Paradise, and ordered us not to let them congregate, for fear they might cause dissension about the dirt we have here in Heaven.

"We call it 'soil,' not 'dirt.'"

"Whatever. We'll talk some more after you finish the form."

After filling out his name, date of birth, sex, country of residence, and date and cause of death, Dr. Arnold answered questions about his publications and his career.

One of these was, “What do you consider the major achievement of your work life?” Dr. Arnold wrote, “I inspired the troops with my slides.”

A few minutes later, St. Peter scanned Dr. Arnold’s form. He paused for a long while as he considered the major achievement. “We used to hear from ‘the troops’ (as you call them) about those slides. One guy or a whole bunch of guys would exclaim, ‘Oh, God, no! Please don’t let him show any more of those slides.’”

“If you saw the slides, you’d see how much I admired God’s handiwork.”

“We’ll take your word for it. Wait here. I’ll be back in a few minutes.”

When he returned, St. Peter announced, “Well, you’re in, but only under four conditions: 1.) no slides, 2.) no shovels, 3.) no congregating with other pedologists, and 4.) a Special Order.”

Dr. Arnold agreed to the first three conditions but asked for a clarification of the last one.

“The Boss says we’ll clarify that one at a time of our choosing. He also told me to inform you that the main reason he’s letting you in is because he feels bad that he did not prevent that little tumble down the stairs in Moscow.”

The next pedologist to approach the Pearly Gates was Tommy Calhoun. During the interview part of the application process, Tommy was relieved to find out that Dr. Arnold had made it in. He thought, “If Dr. Arnold made it, I’m a shoo-in.”

St. Peter had a sad look on his face as the interview began. He did not look Tommy in the eye. “This is a strong application. The Boss admires your exemplary life, your integrity, and your willingness to do Dr. Arnold’s work for him, especially the hard work, the dirty work. That’s the good news. The bad news is that we have to follow the ‘Special Order.’”

Tommy could feel his heart pumping. “What order is that?”

St. Peter held up a sheet of paper and read the order: “’The next 10 soil scientists to approach the Pearly Gates are to be denied access to Paradise.’ Sorry, but it’s time for you to move on.”

“Wait!” Tommy exclaimed. “I neglected to point out that I also worked with cartographers and soil survey editors. I was a program manager as well as a soil scientist.”

“You worked with editors?”

“That’s right, and I admired what they are able to do, especially one named Stan Anderson.”

“You admired Stan Anderson’s work?”

“Yes.”

St. Peter’s face looked sad again. “That’s a pity. He’s the worst quibbler of the lot.” ■

Gary Muckel at the Pearly Gates

Written by Stanley P. Anderson on the occasion of Gary Muckel’s retirement.

St. Peter and the Boss were seated in an all-white, brightly lit room called the Holy of Holies.

“I think that your ‘Special Order’ denying soil scientists access to Paradise is no longer in effect,” St. Peter said. “If you remember, it was to apply to the next 10 soil scientists after Dr. Arnold was let in. Tommy Calhoun was the first one we sent packing. We’ve had 9 applications since then. This new one, from a fellow named Gary Muckel, is the 11th since Dr. Arnold .”

“OK,” the Boss said. “But we still need to make sure that the pedalfers we let in are denied shovels. I don’t want them digging holes all over Heaven, and I don’t want to hear them argue in strange, Babel-like terms about the contents of the holes.”

St. Peter replied, “That’s ‘pedologists.’ These fellows like to call themselves that, especially the ones from the universities. Also, the holes are called “pedons.” Anyway, we have another problem.”

“What’s that?” the Boss asked.

“This Muckel fellow wants to bring in firearms.”

The Boss’s face reddened with anger. “This is Paradise. There are no guns in Paradise. What’s he got? Rifles? Pistols? What?”

“Actually, he has a whole collection. Must be 20 or 30.”

“A collection? How’d he get them up here?”

“In a truck.”

“A truck? He drove a truck packed with guns to Heaven?”

“I guess.”

“Where’d he buy the gas to get here?” the Boss asked.

“Don’t know,” St. Peter responded.

“Why don’t you go tell this fellow that gunpowder was invented by our competitors in the other place, you know, in Hell? Maybe that will change his mind.”

St. Peter paused before he said, “I doubt it.”

“Why’s that?” the Boss asked.

“Well, there appears to be something about the word ‘No’ that Gary Muckel does not understand.”

When St. Peter returned to the Pearly Gates, he noticed that Gary had been joined by a former co-worker, an editor named Stan Anderson. “Oh, it’s you again, Mr. Anderson. I don’t think I have good news for you.”

Neither Stan nor Gary appeared to hear St. Peter, for they were engaged in a heated debate about whether or not the Republican River is crooked.

“With a name like that, it has to be crooked,” Stan claimed.

Gary responded, “As your pal Bill Clinton might say, it all depends on what you mean by the word ‘crooked.’”

Before St. Peter had a chance to intervene, a new argument erupted, this one appearing to be about the alphabet, as far as St. Peter could tell. Stan was in favor of the three letters “PDF,” and Gary was a strong proponent of the four letters “HTML.” St. Peter thought that the matter was just trivial enough to inspire a long, fierce debate between two members of the human race. As this debate ended, Stan enumerated Gary’s faults as a writer, including occasional instances of faulty grammar, bad diction, or poor punctuation and an excessive use of the imperative verb mode.

“If I could have your attention,” St. Peter finally said to Gary, “I have word from the Boss. He won’t let you in with firearms.”

“See, I told you so,” Stan said.

“Why don’t you just back off?” St. Peter said to Stan. Then, he turned to Gary. “You see, gunpowder was invented in Hell.”

“Who says so?” Gary asked.

Stan interjected, “First John Milton and then Jonathan Swift.”

“I told you to back off,” St. Peter said. He then turned to Gary and, improvising just a little, said, “Look, the Boss wants to let you in. I mean, after denying Tommy Calhoun and 9 other soil scientists access to Paradise, he wants to show how merciful he is.”

Gary responded, “Well, then, I guess we have a problem. I just can’t imagine a Heaven without firearms.”

St. Peter returned to the Holy of Holies, where he briefed the Boss on the Muckel matter.

“We have to turn him away,” the Boss said. “Let him wander about in Limbo for a

few eons, and maybe he'll change his mind. That's what we did with that other NRA fellow, you know, the actor, the one who thought he was Moses."

His face clouded with doubt, St. Peter responded, "It could very well take an eternity for Gary Muckel to change his mind."

"So be it," the Boss said. "One other thing before you return to your post."

"What's that?"

"Send that Anderson fellow packing. This is Paradise. There are no editors in Paradise." ■