A Philadelphian perspective on trail expansion – Shaggy dog story – New Dutch research

We Proceeded On

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THE BURNING BLUFFS
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An unusual and gratifying view of the Ionia Volcano, from John Jengo.
With grateful thanks to the photographer.
President's Message

Dear Friends,

With the weather this winter I think we can now all better appreciate the formidable obstacles faced by Captains Lewis and Clark at Fort Mandan, the Bitterroots and Fort Clatsop. While we have to face snowy roads, long lines at the terminal and delayed flights followed by lost or destroyed luggage, one has only to think back 200 years to realize we have nothing to complain about, and from the perspective of the history of the trail we have much to be grateful for. I would first like to thank everyone for the annual appeal response, it is most gratifying to know that we can count on your support. I am also grateful for recent developments in Charlottesville, Virginia, where several Board members and I witnessed the ground breaking for a new Lewis and Clark Exploratory Center and attended an informal listening session on the completion of the trail. It is encouraging to see that the enthusiasm for the story of the Corps of Discovery remains strong all across America.

Our main purpose for going to Virginia was to meet with the consulting team of Charlie Bryan and Dan Jordan. Thanks to these fine gentlemen and their associate Tom Johnson, we were able to spend three days learning about best practices for managing a successful non-profit centered around a historical/cultural treasure. These two men have more experience (at the Virginia Historical Society and the Thomas Jefferson Foundation) between them regarding taking institutions from obscurity onto the national stage than anyone who has advised us thus far. The level of familiarity they have with our current situation is ample. They know who we are and where we need to be to achieve our fundamental goals.

We discussed all of the elements involved in examining mission and vision statements, along with strategic plans suggestions and desired profiles of future Board members. All of these suggestions will be analyzed and discussed at our upcoming meeting in Denver. I look forward to sharing the results of these discussions with you when we meet in Omaha.

The most important thing I learned from meeting with Dan and Charlie is that our organization has plenty of the most vital ingredients for success. We have heart and passion in abundance. Our task is to transfer those two essential qualities into action. I read recently that our generation is going to be described as the last outdoor generation, because our children and grandchildren are slowly but surely becoming oblivious to the world beyond the gadget. They will not find restoration or solace in nature because they have no sense of the importance of place. We have a compelling story, and we have a singular natural resource that we need to share with the rest of our population, young and old. That is the message I hope to communicate during my term as your president and I know the next two presidents feel the same way. Education is the key to our success; education and conservation of our fundamental asset – the Trail itself.

I hope you will join me and the Board in our future efforts to make the Foundation as relevant as we can be; as someone wise once said, “Change is the essence of life. Be willing to surrender what you are for what you could become.”

Stephenie Ambrose Tubbs
President, LCTHF
New Partners on the Trail

As we welcome the New Year, I am very much looking forward to 2011. The past year was a very exciting one for me, providing many opportunities to get to know the partners and staff who study and protect the Lewis and Clark National Historic Trail. I particularly enjoyed the chance to meet so many members of the Lewis and Clark Trail Heritage Foundation as well as members of other partner groups. The national meeting in Lewiston, Idaho, was a great experience, as was the opportunity for the National Park Service Trail staff to host a Foundation board meeting here in Omaha last summer. I continue to be impressed by the expertise and vast knowledge that Foundation members possess about the history of the Corps of Discovery and of the modern day Trail. Much of my time this past year was spent on the preparation and startup of the Trail’s Comprehensive Management Plan. This turned out to be a fantastic chance for me to meet people and see the Trail. While we got off to a great start with public meetings, we learned late in the fall that funding for nearly all the National Park Service’s complex planning projects was being drastically cut or eliminated. Unfortunately, our planning process was not exempt from these cuts. The elimination of planning funds forced us to rethink our approach and make the decision to move forward with a simplified process that could be funded from our park base operating budget. We have elected to enlist expert advice on how to proceed with the Comprehensive Management Plan from the National Park Service planning office in Denver. In spite of this financial setback I am optimistic that we will produce a plan that helps us improve adminstration of the Trail with the help of our partner groups. My biggest regret of the past year is that I did not spend more time on the Trail, meeting people and exploring and studying the journals. I particularly want to spend more time getting to know the various governmental agencies and their staff who have an outstanding track record interpreting and protecting the Trail. I received many invitations to tour the Trail with various individuals and groups that I hope to follow up on this year. One recent opportunity occurred when Foundation members Ross Marshall, Pat Traffas, and Dan Sturdevant took time from their busy schedules to give me an on-the-ground tour of the Lewis and Clark-associated sites in the Kansas City area. Though I visited on an especially crisp winter day, the sun was shining and the company was warm-hearted. I learned a great deal and was again reminded of the importance of the Trail and the Lewis and Clark Expedition in our nation’s history. There is really nothing like going to the areas where the Corps of Discovery traveled or camped and experiencing these sites first-hand. Looking to the future, I sincerely hope to spend even more time on the Trail in the company of friends and partners. I particularly want to get to know and better understand the very important role that other agencies have played in preserving the Trail. I am looking forward to the Foundation’s upcoming national meeting in Omaha this summer. By the end of this year we should complete our two-year effort to create a digital GIS-based map of the Trail that will provide a more accurate record of the historic route. One of my top priorities is for the Lewis and Clark National Historic Trail to focus park resources, both financial and technical, towards supporting our partners. They are critical to the protection, interpretation and understanding of the Trail. The Trail staff has worked hard to support this vision by developing a blueprint for what we call a Partner Support Program, which we hope to launch later this year. I look forward to seeing you out on the Trail and in Omaha at the Foundation’s 2011 annual meeting.

- Mark Weekley
Superintendent
Lewis and Clark National Historic Trail
National Park Service, Omaha NE
http://parkplanning.nps.gov/lecl
http://www.nps.gov/lecl/parknews/newspaper.htm

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The mission of the LCTHF is:
As Keepers of the Story - Stewards of the Trail, the Lewis and Clark Trail Heritage Foundation, Inc. provides national leadership in maintaining the integrity of the Trail and its story through stewardship, scholarship, education, partnership and cultural inclusiveness.

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Letters

Teaching Lewis and Clark; Philadelphian Trail expansion.

Rachel Barnard on teaching the trail

Concerning Ms. Barnard’s fine article and as a former middle school teacher who spent the better part of six weeks on the Expedition, I was surprised that she didn’t mention the Ken Burns special on the Expedition.

Middle schoolers need more than just textbook material to make any history exciting and while the Burns special does use some of the same passages that one finds in all history books, Mr. Burns, Dayton Duncan, Steven Ambrose, et. al. do a very fine job of explaining details of the journey. In addition, the use of maps during the lesson helps students get an idea of where various events took place, especially if the students aren’t from the states included.

I used to have my students draw a name of one of the Expedition’s members from the “hat” and research and write a short paper on that person with the emphasis on that person’s importance to the journey and actions during it; Private Shannon being a good example.

I found that 7th/8th graders could carry on very meaningful discussion about such things as York getting to vote, but yet being treated as a slave when the Expedition returned. Debates, with students taking one side of the room or the other, or sitting in the middle if they had no opinion to start with, lead to some very interesting class periods and often to further personal research.

On another note, I was impressed that Ms. Barnard mentioned the book Lies My Teacher Told Me as a possible reference. Many teachers wouldn’t dream of “going there.”

Bill Casper
Expanding the Lewis and Clark Historic Trail

Not too long ago, in listing which states should be rightfully included in legislation expanding the Trail, one of the participants referred to an epiphany that justified adding Tennessee to the list—"Meriwether was surely and certainly 'on Trail business in 1809' when he met his demise at Grinder's Stand." Others in attendance surprised themselves by quickly seeing the point and agreeing with it completely, thereby satisfying the objections of some not in favor of including specific sites "off the Trail" east of the Mississippi River.

Using the same reasoning, the tale of the Trail after 1806 should expand to and include 1807, when Meriwether went to Philadelphia on Trail business. He went to express his appreciation to his mentors and all others who had helped him in 1803, to sit for his now famous portrait, to leave souvenirs such as his Shoshone tippet for Charles Wilson Peale's Museum, to commission paintings of birds and the Falls of the Missouri, to discuss his plans for treatment of his plant specimens, and to obtain a prospectus for publication of his and Clark’s journals. All vital to the Trail, even if accomplished off it.

Similarly, William Clark's business in 1810 brought him to Philadelphia for three months. He was search of an editor to replace Lewis, having his portrait painted by Peale as Lewis had done, and meeting with prominent citizens of the city. Again, this Trail activity justifies Trail expansion.

Finally, Nicholas Biddle's of the editing the journals with Clark's and George Shannon's help in 1810-1811, and getting them published by 1814 was also clearly Trail related. It is worth expanding this story to its final conclusion.

Today, broad publicity methods mean that the "getting ready" and "putting away" periods so essential to a complete account of any and all endeavors, be it building a house or landing on the moon, can be easily documented and included. Fortunately for us, much of this before-after aspect of the Trail is now illustrated by a brochure titled The Eastern Legacy of Lewis and Clark, which opens with Lewis leaving the White House in March 1803 and ends with the published journals in Philadelphia in 1814.

Eldon "Frenchy" Chuinard would be extremely proud of that expansion. He, the second president of the Lewis and Clark Trail Heritage Foundation, wrote his fellow officers and board of directors in February 1971 that they all should strive to fashion a truly coast-to-coast Trail because that was what it was and is. And in May 1982 he stressed that conclusion more broadly with an article in WPO, suggesting that Philadelphia could be properly considered the beginning and end of the Trail.

I think we can agree that some things may have been done hastily in the 1960s or inadvertently omitted because there was plenty to do at the time west of St. Louis. Now is the time to be all-inclusive. Adding Washington DC, Virginia, Maryland, Delaware, Pennsylvania, Ohio, Indiana, West Virginia, Kentucky, and Tennessee to the Trail is a must, as is the expansion of the story to include 1807, 1809, and 1810-1814. Acceptance of this revision in our concept of the Trail is crucial.

Fortunately the National Park Service already has a program established to obtain Certified Sites to add in the east. It has already done so in Philadelphia. Let's put aside provincialism and concentrate rather on the noble and soul-stirring goals that can inspire and uplift thousands of new Lewis and Clark devotees. Let us come together to re-define and re-assess our vow to be Keepers of the Story (every paragraph of it!) and Stewards of the Trail (every foot of it!). Having the bully pulpit of the Internet is sobering; using it in a righteous cause is exhilarating. And expanding the Trail's time-line to include 1814 is most assuredly a righteous cause! Keep that in mind; and as Samuel Adams stated: "It does not require a majority to prevail, but rather an irate, tireless minority keen to set brushfires in people's minds."

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"BLUE EARTH," "CLIFT OF WHITE"
AND
"BURNING BLUFFS"
Lewis and Clark's Extraordinary Mineral Encounters
in Northeastern Nebraska
BY JOHN W. JENGO

For every Lewis and Clark scholar, aficionado, or casual trail traveler, there are portions of the Lewis and Clark Trail that hold a special meaning, where connections can be made to the captains, the enlisted men, the native cultures, the flora and fauna, or the landscapes that were so vibrantly memorialized in the expedition journals. Those whose interest lies in the earth science aspects of the expedition can readily retrace certain sections of the Trail by tracking down the geological features that Lewis and Clark visited, experienced, and described. Among the most compelling regions are the bluffs of northeastern Nebraska from southeast of present-day Ponca State Park leading northwestward up to the Calumet Bluffs. It was along this extraordinary stretch of river and
terrain, which the expedition traversed between August 22 and September 1, 1804 (a distance of approximately 95 river miles according to Clark’s figures), that the most intensive mineral collecting took place. As a consequence of the Missouri River running close to the base of the bluffs in strategic areas, rock formations were revealed to the explorers that were geologically diverse, distinctly colored, rich in mineral content, and in some places, dramatically distinguished by steaming and smoking hot earth that beckoned to be investigated.

In the early morning of August 22, 1804, with the memory of burying their “Decesed brother” Sergeant Charles Floyd still fresh in their minds, Meriwether Lewis, William Clark, and the Corps of Volunteers for North Western Discovery pushed off from their camp for another day’s struggle against the unrelenting current and stiff winds along the Missouri River. It already had the makings of an important day as the captains had decided the time had come for a vote to determine Sgt. Floyd’s replacement. But the focus of this day changed some two and a half miles out of camp. While laying up at present-day Aowa Creek, Nebraska to meet two hunters who had brought in game, a distinctive feature of the landscape attracted the captains’ attention. Either from their own observations, or from a sample brought in by the inquisitive John Shields, the captains noted that the bluffs on the larboard side of the Missouri River possessed something more interesting than any of the rocks they had encountered since embarking from St. Louis.

And so it was that Meriwether Lewis probably retrieved a copy of Richard Kirwan’s Elements of Mineralogy from a keelboat locker to re-acquaint himself with the procedures of assaying and identifying mineral deposits. Here, at the mouth of Aowa Creek, were rock exposures that were worthy of experiment. Lewis was already aware, by virtue of his scientific training in Philadelphia in the spring of 1803, that many of the diagnostic mineral tests in Elements of Mineralogy required smelling the fumes emitted from specimens. This was true whether the sample in question was arsenic (“this Calx is often found in Clays and blue Marles and may be distinguished by its smell when thrown on burning Coals”) or other ores (“In the dry way, it is discovered by its evaporation, in the form of a white Smoke on burning Coals or red hot Iron, with its peculiar smell”). Viewing what he and Clark thought might be cobalt, Lewis knew that “When Arsenical it [cobalt] gives out that smell on burning coals.” So Lewis headed up to the bluffs to pursue his scientific duties, undoubtedly pleased that he could begin to fulfill President Thomas Jefferson’s objective of ascertaining “the mineral productions of every kind” in this new terrain.

An Experiment Goes Badly

Clark vividly described the rock exposures at the mouth of present-day Aowa Creek, just a few miles upriver from their encampment on August 21, 1804.

**August 22, 1804: Commencement of a Bluff on the L.S....This Bluff contain Pyrites alum, Copperass & a Kind Markesites. also a clear Soft Substance....Capt lewis was near being Poisoned by the Smell in pounding this Substance I belv to be arsenic or Cabalt.**

*Clark, Field Notes*

examination of this (1) Bluff Contained alum, Copperas, Cobalt, Pyrites; a alum rock Soft & Sand Stone. Capt. Lewis in proving the quality of those minerals was near poisoning himself by the fumes & tast of the Cabalt which had the appearance of Soft Isoglass- Copperas & alum is very pure. *Clark, Notebook Journal*

The bluffs at this location are primarily comprised of Cretaceous age Graneros Shale and Greenhorn Limestone. Clark did well here to mark the presence, probably in the Graneros Shale, of pyrite and marcasite, both iron sulfide minerals with an identical chemistry but different crystal forms. Sgt. John Ordway provided helpful detail as well when he described one of the minerals as “brass,” which is the signature color of pyrite and marcasite, and recorded that the minerals had a “Sulpheras Smell,” another positive indicator of iron sulfide minerals. Mineral specimens were collected here, probably by Lewis himself. For at least one specimen, Clark

*Left: The formation beneath the prominent, cliff face of Greenhorn Limestone here in Ponca State Park is the gently sloping Graneros Shale, which contains layers of the mineral melanterite. Melanterite, formed after the decomposition of pyrite or marcasite, can have a striking bluish green color that the captains either mistook for cobalt or correctly identified as “copperas” and it’s a strong candidate for one of the tested minerals that debilitated Meriwether Lewis on August 22, 1804.*

*Photo: John W. Jengo*
(in the Field Notes) described Lewis as “pounding this Substance”” and he recorded in his Notebook Journal that Lewis went further, inhaling the fumes and tasting the specimen(s). The way both the field notes and journal entries are presented (presumably chronologically), it could be surmised that Lewis performed the tests at the site of the collection, because Clark described Lewis’s physical condition right after his description of the mineral content of the locale, followed by the subsequent events of the day. The experiment went badly. While there is uncertainty regarding what minerals Lewis attempted to assay using this method, the fumes and ingestion of these substances made him ill, with an aftereffect that would linger for several days. It’s probable that Lewis hoped he could recover on his own, but Clark reported that his friend took “a Dose of Salts this evening to carry off the effects.”

Farther upriver in what is present-day Ponca State Park, one of the most complete and accessible outcrops in this region lies adjacent to the park’s boat ramp. This exposure is approximately 5.5 miles upriver from the bluff that Clark described earlier on August 22nd, so it probably is not the exact spot that Clark noted as being “Seven miles above.” Nevertheless, the river-facing bluffs along this route expose two of the same geological formations the captains encountered at the mouth of Aowa Creek:

**August 22, 1804:** Clift of Allom Stone of a Dark Brown Colr. Containing also in crusted in the Crevices & Shelves of the rock great qts. of Cabalt, Semented Shels & a red earth. *Clark, Notebook Journal*

The formation at ground level is the gently sloping Graneros Shale, a medium to dark gray, partly calcareous shale with interbeds of bentonite, siltstone and sandstone, which is overlain by a prominent outcrop of Greenhorn Limestone, a light gray, ledge-forming limestone with interbeds of marl and calcareous shale. To check on Clark’s journal description, it was critical to see if any incrustations could be found in the crevices of the rock or in association with “Semented Shels”. During one visit, I picked a route between fallen slump blocks to try to reach the sharply defined ledges near the top of the bluff. While passing upward through the Graneros Shale, I observed rock fragments covered with the iron sulfide mineral marcasite. Although it was not evident to me on that day, melanterite, a hydrated iron sulfate (FeSO₄) formed after the decomposition of pyrite or marcasite (iron sulfide or FeS₂) is also present in the upper section of the Graneros Shale. Melanterite can have a striking bluish green color that the captains either mistook for cobalt or correctly identified using the antiquated term “copperas.” Copperas (which will be referred to as melanterite hereafter) is a strong candidate for the mineral that Lewis tested on August 22nd. When this mineral is formed from the oxidation of iron sulfide, the reaction also produces sulfuric acid (H₂SO₄), a highly corrosive substance that can seriously damage the skin upon contact or the lungs when inhaled. This suggests that Lewis may not have needed to “roast” this mineral because just “pounding” the specimen and coming into contact with the associated sulfuric acid would have deleterious effects.

There’s one piece of compelling internal evidence for this theory in addition to the fact that Clark specifically identified “copperas” as being present at the outcrops they were examining. Sometime after working through the potential chemistry of what Lewis and Clark were encountering at these outcrop exposures, I updated the antiquated descriptive
terminology in the explanatory notes of the mineral specimens that Lewis sent back East from Fort Mandan. Shortly after the Fort Mandan mineralogical specimens arrived in Philadelphia, Adam Seybert, physician, gentleman scientist, and leading mineralogy expert, added supplemental mineralogical identifications to augment Lewis's original descriptions. An extensive annotation Seybert added to Lewis's description of Fort Mandan mineralogical specimen No. 4, collected on August 23, 1804, observed that it "consists principally of Sulphat of Iron derived from decomposed Sulphuret of Iron." Remarkably, Seybert described the same reaction of iron sulfide (Seybert's "Sulphuret of Iron") to form malanterite (iron sulfate or Seybert's "Sulphat of Iron") that occurs in nature within the bluffs of northeastern Nebraska, thus providing additional evidence that this mineral was present in these localities for Lewis and Clark to encounter.

On my investigation of the bluffs, I finally reached the basal unit of a superb exposure of the Greenhorn Limestone. It is deceptive in its initial appearance because it seems to be comprised of different colored rocks, grading from a light gray in some sections to a color resembling hazelnut coffee creamer in others. However, it is all the same formation. Like most limestones, including those Lewis and Clark examined at the Three Forks of the Missouri, this formation is a gray color in fresh exposures, but weathers to a light tan to cream color once it has been exposed for a period of time. In examining some of the Greenhorn Limestone slump blocks downslope, I was soon rewarded with a spectacular view of selenite crystals (a transparent, colorless variety of gypsum) that had formed in the fractures in the limestone. These selenite crystals, a hydrated calcium sulfate (CaSO₄·2H₂O) are striking enough in appearance to justify the captains' interest in them, and were second only to the number of iron sulfide minerals, and their reaction byproducts, that they observed and collected. Selenite covers broad surfaces of these rock fractures, forming when sulfuric acid reacts with the calcium carbonate (CaCO₃) of the limestone. Also present along bedding planes of the limestone are dense remnants of the extinct bivalve Mytiloides sp. or Inoceramus sp., the "Semented Shels" that Clark notes in his journal.

To return to the sequence of events on August 22, 1804, Lewis and Clark examined the bluffs at the confluence of Aowa Creek when they landed to pick up two deer that their hunters had killed. Intrigued by what they saw there, Lewis decided to perform his ill-fated experiments, most probably on iron sulfide minerals (pyrite or marcasite) or on the secondary mineral malanterite. Not discouraged by the aftereffects his friend suffered, Clark kept an eye out for additional exposures upriver. At certain loops of the river, bluffs were right along the shoreline and rock exposures would have been obvious no matter where the keelboat and pirogues were. If Lewis did, in fact, become ill from exposure to sulfuric acid after testing the minerals near Aowa Creek, it would be logical to assume that any further, collecting or observation that occurred upriver was conducted instead by Clark. Regardless of who did the work, the result was the single most productive day of collection on the 1804 leg of the expedition. At least nine mineral specimens were collected. On the following day, at least six more samples were obtained, including one of the three documented surviving mineral specimens, Fort Mandan mineralogical specimen No. 8, which has now been identified as selenite. The list of mineral specimens collected on August 22nd doesn't indicate at which locality the nine samples were collected, but it can be deduced that some were collected at Aowa Creek. That certainly includes Fort Mandan mineralogical specimen No. 68, recorded as having been "brought [to] us by one of our hunters, John Shields who found it at the Allum Bluff," the same location that Clark described as having "great quantities of those minerals."

"Blue Clay," Bluffs "on Fire" and the Ionia Volcano

Among the most significant scientific remarks to be recorded on the entire expedition, and one that would generate great interest from the scientific community back in Washington upon the expedition's return, was Clark's observation from August 24th:

August 24, 1804 Commencement of a blue Clay Bluff of 180 or 190 feet high on the L.S. 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 depth, gret appearance of Coal. An emence quantity of Cabalt or a Cristolised Substance...on the face of the Bluff. Clark, Notebook Journal

Clark's "Blue or Dark earth" or "blue Clay Bluff" notations typically refer to the Cretaceous age Carlile Shale. This observation is supported by Ordway's journal, which says that this deposit had great quantities of "mineral Substance," and would undoubtedly have included selenite. On-site examiners should note that it is

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Ionia Volcano, an exposed bluff of Carlile Shale that includes a selenite-rich outcrop of “blue earth,” is located approximately 3.5 miles northeast of Newcastle, Nebraska. Cartographic reconstructions have concluded that the Missouri River was not undercutting this bluff when the expedition passed through on August 22, 1804 and neither the captains nor the other journal keepers had taken note of any volcanic occurrences in this area, indicating that the Ionia Volcano was not the subject of the captain’s subsequent bluffs “on fire” observations.

The fascinating chemical reaction Lewis and Clark saw in 1804 begins with iron sulfide minerals present in the Carlile Shale. Iron sulfide (FeS₂), particularly in the form of the mineral marcasite, reacts readily with oxygen (O₂) and water (H₂O) to produce ferrous iron (Fe⁺₂) and through a follow-up reaction with oxygen and hydrogen, ferric iron (Fe⁺₃) is produced. Not only is this reaction “exothermic” (releasing energy in the form of heat), it also has a positive feedback loop component; when ferric iron is produced, it can also oxidize iron sulfide minerals. This process has a chain reaction component; the hydrogen (H⁺) that is thrown off also lowers the pH, which creates an environment for acid-loving microorganisms (or acidophiles) to participate in and accelerate the reaction (by “up to few orders of magnitude” under certain conditions).

Interestingly, museums constantly wrestle with the degradation of iron sulfide minerals in their collections because of this same phenomenon. It is likely the reason why mineralogist Adam Seybert was already noting decomposition of some of Lewis’s pyrite/marcasite specimens after their arrival in Philadelphia. For example, Seybert documented that the Fort Mandan mineralogical specimen No. 41, collected on August 23, 1804, had “Pyrites decomposed” and other iron sulfide samples in the collection were “in a state of efflorescence.”
Above: Detailed route map of the August 22-24, 1804 expedition traverse up the Missouri River in northeastern Nebraska. By mapping the 1804 course of the river, the present-day location of the "Ionia Volcano," and the position of the "Rugged Burning Bluffs" observation made by William Clark west-northwest of present-day Lime Creek, it is evident that Ionia Volcano locale has been incorrectly linked with the essential expedition observation that "Those Bluffs appear to have been lately on fire, and at this time is too hot for a man to bear his hand in the earth." Base Map Data ©2009 Google; annotations: J. W. Jengo.

Right: Clark's bluffs "on fire" observation on August 24, 1804 should actually be applied to the rock exposures west-northwest of the Route 15 bridge at Mulberry Bend SWMA, upriver of Missouri River's former confluence with Lime Creek, which corresponds to an area where the Carlile Shale was broadly exposed to, and literally on the edge of, the 1804 position of the river. Photo: John W. Jengo

The unique feature here is the interaction between the iron sulfide and clay minerals that comprise the Carlile Shale. The clay minerals absorb and retain water, critically driving the reaction. If lignite (the lowest grade of coal) is present, it will ignite and generate its own heat as well. These reactions are the source of the "burning bluffs" so famously described by Clark, and confirmed by the ever-diligent Sgt. Ordway, who remarked that the "burning bank or Bluff" had a "Sulpheras Smell." Yet unfailingly, the description is ascribed to the so-called Ionia Volcano, a narrow exposed bluff located approximately 3.5 miles northeast of Newcastle, Nebraska. The Ionia Volcano, though, is not the only Carlile Shale bluff in this locale so it was worth questioning how this particular bluff came to be identified as "the" pseudo-volcano that Clark was describing. That this general area was the site of pseudo-volcanic activity seems indicated by its name, "Volcano Hill". But in 1804, the river was at least one mile away according to Martin Plamondon's cartographic reconstruction; thus, it can be confidently concluded that the Missouri River was not actively undercutting this bluff when the expedition passed by on August 22, 1804.

Expedition maps of the painstaking haul up the Missouri River during this time period clearly reveal that they passed the Ionia Volcano locale on August 22nd, and camped on the opposite side of the river. Neither
the captains nor the other extant journal keepers (Ordway, Whitehouse, and Gass) noted any volcanic occurrences, suggesting that the Ionia Volcano was not the subject of Clark’s subsequent observations. If Clark was recording his August 24, 1804 Field Notes observations in the present tense (and the geological details on expedition maps verify that he was), then the Ionia Volcano locale has been incorrectly linked with this essential expedition observation. If the expedition route mapped by Martin Plamondon is accurate, Clark’s “on fire” observation on August 24, 1804 should actually be applied to the rock exposures west-northwest of the Route 15 bridge at Mulberry Bend SWMA, upstream from the river’s former confluence with Lime Creek (see map). Clark was quite specific that the “Blue Clay Bluffs” that “have been latterly on fire” commenced 2.5 miles upriver from the expedition’s August 23rd encampment, and that they traveled along these “very hot” bluffs for 1.75 miles. According to geological maps, the burning bluffs location correlates precisely with an area where the Carlile Shale was broadly exposed to, and literally on the edge of, the 1804 position of the river, thus providing William Clark with an opportunity to examine firsthand that these bluffs were “too hot for a man to bear his hand in the earth.”

**Cliffs of White Earth**

One of the most distinct changes in the geological terrain along the expedition route was immediately recognized by William Clark. He was accurate in describing the Cretaceous age Niobrara Formation as a chalk deposit.

**August 26, 1804:** a Cliff of White earth on the L. S of 2 ms. in length. *Clark, Field Notes*

**August 27, 1804:** passed a white Clay marl or Chalk Bluff under this Bluff is extensive I discovered large Stone much like lime incrusted with a Clear Substance which I believe to be Cabalt, also ore is imbeded in the Dark earth, resembling Slate much Softer. *Clark, Notebook Journal*

**August 28, 1804:** passed a Short White Bluff of about 70 or 80 feet high. *Clark, Notebook Journal*

Chalk is a relatively soft and pure form of limestone and is composed primarily of calcium carbonate (CaCO₃), in the form of spherical skeletons called cocospheres from a group of chalk forming plankton (single-celled algae). Certain strata of chalk are white for a very different reason than the bleaching of the sandstones the captains encountered at the White Cliffs of the Missouri. White chalk is essentially free from other sediments or minerals that would discolor it. It is thought that for this to occur, the sedimentary paleo-environment of chalk deposits had to be in clear marine seas far from adjacent landmasses, keeping them isolated from eroded sediments that would affect their composition and color.

Because the Niobrara Formation is a bluff-forming horizon, its most accessible modern exposures are along road cuts that descend onto the flood plain of the Missouri, such as 563 Avenue northwest of St. Helena, Nebraska. Here, the formation is comprised of both massive exposures of chalk and intervals of chalky shale that appeared to have been “chinked” (like old-fashioned mortar) with fragments of medium gray to white chalk. These outcrops remind the viewer of Clark’s appropriate use of the word “marl,” defined as a loose, well-blended combination of clay and calcium carbonate. As far as Clark’s “large stone” is concerned, flint nodules can easily be found in the Niobrara Formation; it has been surmised that these nodules developed, probably after multiple rounds of dissolution and re-crystallization, from the siliceous skeletons of organisms such as sponges.

**The Calumet Bluffs**

One of the primary geological highlights in this region is Calumet Bluffs, the site of an important council with the Yankton Sioux on August 30-31, 1804. Upon embarking on the following morning, Clark noted:
Sept. 1, 1804: pass Calumet Bluff of a yellowish read [red] & brownish white Hard clay, this Bluff is about 170 or 180 foot high here. Clark, Field Notes
proceeded on pass the Bluffs Compsd. of a yellowish red, & brownish White Clay which is a hard as Chalk this Bluff is 170 or 180 feet high. Clark, Notebook Journal

Construction of the Gavins Point Dam in 1952-1957 significantly disturbed the chalk cliffs located immediately downstream. A few exposures remain on the Nebraska side, including a narrow bluff immediately east of the spillway and a low-lying cliff hidden in a birch tree woodland between the boat ramp parking area and Route 12. At this latter outcrop, the Niobrara Formation is comprised of medium gray to white chalk that was fractured extensively into tabular sheets and blocks. It has the appearance of a well-worn white masonry wall. The Niobrara Formation is spectacularly exposed above the waterline on the upstream side of the dam all the way past the Bon Homme-Yankton County line. These upriver exposures are, as Clark noted, not pure white but yellowish orange, suggesting either depositional impurities or post-depositional staining. The Niobrara Formation is one of the most extensive rock units in the Great Plains, and was deposited between 87 and 82 million years ago during the Late Cretaceous Period. Most chalk deposits worldwide were formed during the Cretaceous Period, the most famous being the White Cliffs of Dover. They record a time when global sea levels were at one of their greatest heights in the last 570 million years, due to several factors including the break-up of the supercontinent of Pangaea. Chalks are so representative of this time period that the word Cretaceous was derived from the Latin word for chalk - *creta*.

Lewis and Clark knew how to recognize chalk, even though they opted to initially identify these chalk exposures cautiously as "Clay which is a hard as Chalk." When the captains had the opportunity to closely examine the formation, it's easy to imagine them chipping off a piece and perhaps running it across one of their writing slates to find it produces a distinctive streak as strong and dense as schoolhouse chalk. Whether or not they did so, they subsequently labeled a specimen as Fort Mandan mineralogical specimen No. 52. It became one of the key mineralogical samples sent back East.
Conclusions

The true impact of the scientific discoveries of the Lewis and Clark Expedition has been a source of much debate. Viewpoints vary widely among scholars, historians, and enthusiasts. Analysis of this issue will continue, and new information and historical evidence regarding the extent of the propagation of Lewis and Clark's findings continues to be researched. We may never know the full historical impact of Lewis and Clark's discoveries upon nineteenth-century scientific inquiry, but one example highlights how just a series of conversations with the returning explorers allowed a significant earth science discovery to be revealed to the scientific community, a discovery that began with that fascinating passage through the geological landscape of northeastern Nebraska.

Samuel Latham Mitchill was a physician, naturalist, university lecturer on botany, zoology, and mineralogy. During the time period when Meriwether Lewis returned from the expedition, Mitchill was also a Senator from New York State (1804-1809). Contemporaries describe him as almost a living encyclopedia of knowledge. During his tenure in Washington (he also served in the House of Representatives between 1801-1804 and 1810-1813), Jefferson described him as the “Congressional Dictionary.” Mitchill appears to have had ready access to the President's House, and knew Lewis before the Expedition departed. He probably spoke to the explorer a great deal about the scientific objectives of the enterprise.

An indication of how intensely interested Mitchill was in the scientific outcome of the expedition is also shown by the fact that he met with Lewis on December 30, 1806, only two days after Lewis returned to Washington. The following week, in anticipation of another meeting with Lewis, Mitchill composed a letter to his wife Catherine recounting one of the salient topics that he and Lewis had discussed previously. Mitchill, one of the nation's leading naturalists, could not contain his enthusiasm about one specific geological region.

In a late conversation I had with him he gave me a description of the burning plains up the Missouri...I never understood their meaning until now. You see now that the minerals called volcanic are not necessarily the production of volcanoes, but of plains burning under-ground. Such are the curious processes of Nature, and so wonderfully diversified are her works.

Although it is likely that Lewis was also referring to the lignite beds in present-day North Dakota in addition to the first pseudo-volcanoes the expedition encountered in northeastern Nebraska, the dissemination of this important geological finding could not have been made more quickly or to a better proponent. Mitchill soon published it and other consequential expedition discoveries in the early 1807 issue of the Medical Repository, America's first medical journal, which he co-founded in 1797. On the subject of the burning bluffs and the mineral collection made on the expedition, Mitchill summarized his conversations with Lewis quite succinctly:

He has made as large a collection of these [minerals] as he could...they serve to enlarge our knowledge of the earths, metals and other fossils of those extensive tracts....It is curious how nature works: in Europe, lava, slag and pumice are the products of burning mountains or volcanos; but in some of the countries through which the Missouri passes there are vast burning plains, where all the volcanic productions are formed by the intensity of fire, without the smallest appearance of a mountain.

Seven years in advance of the publication of the two-volume History of the Expedition under the Command of Captains Lewis and Clark (known as the Biddle's History edition), Samuel L. Mitchell promptly introduced some of Lewis and Clark's most important geological discoveries into the scientific literature, positively influencing subsequent inquiry and exploration into the true nature of northeastern Nebraska's intriguing exposures of “blue earth,” “clift of white,” and “burning bluffs.”

John Jengo, a member of the Philadelphia Chapter, is a professional geologist who works for an environmental consulting firm in Pennsylvania. He has published numerous articles in WPO since 2002 on the subject of Lewis and Clark's mineral collection, the significance and scientific influence of their geological discoveries, and the potential existence of the expedition copy of Richard Kirwan's Elements of Mineralogy. He was a presenter at the 2003 annual meeting in Philadelphia.
Notes

1 Some 49% of the 47 minerals that have documented collection dates were obtained in this short time period, making it by far the most productive sampling phase of the expedition.

2 Gary E. Moulton, ed., The Journals of the Lewis and Clark Expedition, August 30, 1803-August 24, 1804 (Lincoln, Nebraska: University of Nebraska Press, 1986), Vol. 2, p. 495. All Lewis’s or Clark’s journal quotations between August 22-24, 1804 in the ensuing text are from Moulton, Journals, Vol. 2, by date.


4 Ibid., p. 438.

5 Ibid., p. 273.


7 Aowa Creek has been correlated with Clark’s dream-inspired name of “Roloje” Creek; Clark described this stream as coming “in from the L.S. passing under the Cliffs for several Miles,” meaning the creek was passing under bluffs that bordered the Aowa Creek drainage, and not those cliffs that face the Missouri River. Perhaps Clark got this information from Shields or the other unnamed hunter they were meeting at this confluence, or he explored this creek himself while Lewis was collecting and testing minerals.

8 Clark, Field Notes in Moulton, Journals, Vol. 2, p. 500. Also referred to as Clark’s “River Journal,” these were first-draft notes presumably recorded under less favorable weather conditions that were later copied into the Notebook Journals.

9 Clark, Notebook Journal in Moulton, Journals, Vol. 2, p. 501. These entries were recorded in the renowned small, stenographer-like notebooks that the captains intended to be the official journals of the expedition.


13 There appears to be an error on Martin Plamondon’s cartographic reconstruction of this day’s travel; see Martin Plamondon II, Lewis and Clark Trail Maps: A Cartographic Reconstruction, (Pullman: Washington State University Press, 2000), Vol. 1, p. 105. I have taken Clark’s initial S47°W and subsequent due West course and distance call from the previous day’s encampment, and ended up on the south side of Aowa Creek whereas Plamondon took these bearings and ended up over a mile away on the north side of the creek. By my reckoning, it appears that Plamondon mistakenly used a S70°W bearing instead of S47°W. This is very important because it determines the location of the mineral bluffs that Lewis sampled and Clark described. The reason I may be correct is that Clark had Aowa Creek coming in “above this Bluff,” which would place the mineral bluffs south of the creek’s confluence with the Missouri River. In ground-truthing this supposition, I found numerous exposed bluffs along 594 Avenue on the south side of present-day Aowa Creek that are promising candidates for the bluffs Lewis initially sampled, but there are also fine bluff exposures north of the creek that the captains may also have examined.


15 Ibid, p. 501. There’s an internal discrepancy associated with this distance call. Clark’s course and distance for this tran-
sect adds up to eight miles, not seven, and Clark appears to have replaced “eight” miles with “seven” miles in his notebook journal entry for some reason. Another issue about where this distance call ends up (which determines which outcrop the captains observed later in the day) relates to where the distance call starts (north or south of Aowa Creek), which is affected by the bearing error described above.


17 Roger K. Pabian and Dennis R. Lawton, Geology of Ponca State Park, Nebraska, Educational Circular 6 (University of Nebraska-Lincoln: Institute of Agriculture and Natural Resources, 1984), p. 32.

18 The blue color is derived from impurities of copper that replace some of the iron in the crystals; the name “copperas” is from the Greek meaning “copper water.”

19 Contact with sulfuric acid will burn the skin, and breathing sulfuric acid causes respiratory tract irritation. Melanterite is one of the few sulfates that are soluble in water, and that may have been the manner in which Lewis ingested it; if so, in combination with sulfuric acid, Lewis could have experienced burns to his mouth, throat, and stomach, triggering gastrointestinal distress.

20 The Fort Mandan mineralogical specimen numbers used in this article follow those that were recorded in the Donation Book of the APS, see Gary E. Moulton, ed., The Journals of the Lewis and Clark Expedition, August 25, 1804-April 6, 1805 (Lincoln, Nebraska: University of Nebraska Press, 1987), Vol. 3, pp. 473-478. Any reference to a mineral specimen in the narrative prefaced by “Fort Mandan mineralogical specimen” refers to those minerals primarily collected in 1804 and sent back East from Fort Mandan in April 1805. All Lewis or Clark journal quotations between August 25-September 1, 1804 in the ensuing text are from Moulton, Journals, Vol. 3, by date.


22 Moulton, Journals, Vol. 3, p. 473. The term “sulphuret” was in common use in this time period and was subsequently replaced by the term “sulfide.” This transition was occurring around the time of the publication of William Barstow, Sulphurets: What They Are (New York, NY: A. Roman and Company, 1867), 114 p.


24 The nine samples collected on August 22, 1804 are Fort Mandan mineralogical specimens Nos. 10, 13, 18, 20, 38, 49, 51, 56, and 68; most of these appear to have been iron sulfide minerals (e.g., pyrites) and so-called crystallized “Sulphat of Lime,” or selenite) Lewis was apparently collecting different selenite crystal configurations not knowing they were chemically the same mineral. Appreciative thanks to Sandy Schenck of the Delaware Geological Survey and Dr. Peter Leavens of the University of Delaware for confirming the mineralogy of the Greenhorn Limestone selenite samples collected by the author.

25 The fascinating relationship between the iron sulfide minerals pyrite and marcasite oxidizing to form melanterite and sulfuric acid, with the sulfuric acid reacting with calcium carbonate to form selenite and reacting with aluminous and potassic-containing rocks to form a potassium aluminum sulfate (alum), intimately links all their parent geological units into one enormous chemical laboratory.

26 Moulton, Journals, Vol. 2, p. 501. In the geological literature, these fossils are identified as Inoceramus, which used to be synonymous with genus Mytiloides, but recent paleontological research has suggested that these extinct bivalves should be distinguished from one another. Given the regulation prohibiting collection of fossils within the park, I was unable to acquire samples for further study to determine which genus identification (Inoceramus or Mytiloides) is correct. The differences are very subtle and require detailed morphological analyses.


OPTIONAL PRE-MEETING TOUR “A”: Omaha/Council Bluffs: Thursday/Friday, 28 & 29 July

OPTIONAL PRE-MEETING TOUR “B”: Nebraska City, Lewis & Clark Interpretive Center, Saturday, 30 July

Sunday, 31 July: Afternoon at Joslyn Museum and Witherspoon Hall
* Dr. Clay Jenkinson: In the Footsteps of Lewis & Clark: Prince Maximilian and Karl Bodmer
* Tour of Joslyn galleries and book signing
* Opening reception at Embassy Suites

Monday, 1 August:
* Foundation Business Meeting
* Awards Luncheon
* Afternoon presentations:
  * Stephanie Ambrose-Tubbs: Miscreants in Lewis & Clark History
  * Kira Gale: When Council Bluffs was on the Upper Missouri
  * Neal Ratzlaff: Observing Nature with the Corps of Discovery
* Dinner Keynote Address: Tim Cowman: Missouri River Corridor Before and After Lewis & Clark

Tuesday, 2 August: Bus Tour to Sioux City and Onawa, IA
* Re-enactment of Sgt. Floyd burial
* Box lunch at Chris Larson Park
* Tour Sgt. Floyd River Museum and Welcome Center and Sioux City Lewis & Clark Interpretive Center
* Daniel Slosberg interprets Pierre Cruzatte with John Mangan and the Omaha Nation School Band
* Lewis & Clark State Park and keelboat display
* Dinner on your own

Wednesday, 3 August: Bus Tour to Fort Atkinson State Historical Park
* Jan Donelson, Bud Clark and Otoe-Missouria delegation re-enact the “First Council”
* Morning Presentations:
  * Jeff Barnes: Forts of Omaha and Council Bluffs
  * Mike Berger: Lewis & Clark Psychology: Moses Reed
* Tour of Fort Atkinson and lunch
* National Parks Building: performance by Camp Pomp attendees: “First Encounters”
* Western Historic Trails Center: Darrel Draper as George Drouillard: hunter, interpreter and sign talker
* Closing Banquet Keynote Address by Dr. James Ronda: First Encounters, Second Looks
* Invitation to 44th Annual Meeting in Clarksville, Indiana

OPTIONAL POST-MEETING TOUR “C”: Northern Tour, Thursday, Friday & Saturday, 4, 5 & 6 August

- See next page for optional tour details -

ADDITIONAL ACTIVITIES

Fontenelle Forest Bird Walk; Living History Encampment; Riverfront Bicycle Ride; Camp Pomp; Teachers Workshop; New Members, Chapter Presidents and Past Presidents Meetings; Vendors, Exhibitors and Book Sales.
43rd Lewis and Clark Trail Heritage Foundation
Annual Meeting
Omaha, NE/Council Bluffs, IA 30 July - 3 August 2011

OPTIONAL ACTIVITIES

Pre-Meeting Tour "A": Omaha/Council Bluffs
Thurs. & Fri., 28 & 29 Jul.
Cost: $350 (Bus & Meals Included)
Minimum 10; Maximum 20 participants
Day 1, Thurs. 28 Jul.
- Confluence of the Missouri and Platte Rivers
- Lewis and Clark Monument, Council Bluffs, IA
- The Bertrand Exhibit, De Soto Bend, IA
- Union Pacific Railroad Museum
Day 2, Fri. 29 Jul.
- Strategic Air and Space Museum
- Fr. Flanagan's Boys Town
- Omaha Pioneer Park Sculptures
- Ft. Omaha
- Heartland of America Park

Pre-Meeting Tour "B": Nebraska City
Sat., 30 Jul.
Cost $55 (Bus, Lunch and reception included)
- Lunch at the Lied Conference Center
- Tour of Arbor Lodge and Arbor Day Farm
- Tour of Missouri River Basin Lewis & Clark Interpretive Trail & Visitor Center
- Earth Lodge
- Welcoming reception for members of the Otoe-Missouria Tribe; light hors d'oeuvres

Post-Meeting Tour "C": Northern Tour
Thurs., Fri. & Sat., 4, 5 & 6 Aug.
Cost $650 (Bus, Meals & Lodging included)
Minimum 10; Maximum 20 participants
Day 1, Thurs., 4 Aug.
- The Bertrand Exhibit, DeSoto Bend, IA
- Lewis & Clark Murals, Sioux City, IA
- Sgt. Gass Memorial State Park, Elk Point, SD
- Spirit Mound, SD
- Missouri River Overlook, Vermillion, SD
- Pierre Dorian Burial Site, Yankton, SD
- Argo Hotel, Crofton, NE
Day 2, Fri. 5 Aug.
- Kreycik Riverview Elk/Bison Ranch, Niobrara, NE
- Old Baldy, Lynch, NE
- Ashfall Fossil Beds, Royal, NE
- Sites along the Shannon Trail
- Ponca State Park
Day 3, Sat. 6 Aug.
- Chief Blackbird Burial Site, Decatur, NE
- Pelican Island, Tekamah, NE
- Tour and Afternoon Tea, Ft. Omaha, NE

TEACHERS' WORKSHOP
Mon., 1 Aug.
Cost $50 (Includes lunch)
Minimum 10; Maximum 25 participants
A 1-day Teachers' Workshop is planned which will include hands-on activities and educational opportunities offered on the subject of Lewis & Clark. Presentations include "First Encounters of the Lewis and Clark Expedition on the Middle Missouri" and "Using Technology in the Classroom to Teach Lewis and Clark Subject Matter."

CAMP POMP: Ages 6-18 yrs
Cost $200
Includes bus trips, lunches/evening meals
Minimum 10; Maximum 25 participants
Children will learn about the adventures of the Lewis & Clark Expedition along the Middle Missouri. Activities include drama and crafts. Children will present a play focusing on the "First Encounters on the Middle Missouri" to be presented for the attendees on 3 Aug. On Tues. and Wed., Aug. 2 & 3, children will travel on the bus with their parents to the re-enactments in Sioux City, IA and Ft. Atkinson, NE.
Registration Instructions
(REGISTRATIONS LIMITED TO THE FIRST 400)

Registration Fees: Postmarked before 15 June 2011, $345; after 15 June 2011, $400. Fees may only be paid by check or money order. Registration form and fees should be mailed to Mouth of the Platte, Inc., P.O. Box 3344, Omaha, NE 68103. Questions may be addressed to: mouthoftheplatte@cox.net or call Della Bauer at 402-697-8544.

Cancellations/Refunds: Cancellation requests postmarked prior to 15 June 2011, will receive full refund minus a $50 handling charge. Refunds postmarked from 15 June to 15 July 2011, will receive a 50% refund. Requests for refunds after 15 July 2011 will be considered only for emergency or extenuating circumstances.

Confirmation Notices: All attendees will receive confirmation of registration. Confirmation notices will include a receipt of payment and a complete schedule of events as well as any other pertinent information. Confirmation notices will indicate whether a registration is complete or requires additional information. Please read your confirmation notice carefully. To report a correction or discrepancy call the number indicated on the notice. If you have not received a confirmation within three weeks of submitting your registration form, write or email Mouth of the Platte, Inc., PO Box 3344, Omaha, NE 68103 or mouthoftheplatte@cox.net.

Silent Auction: If you have Lewis & Clark items you would like to donate to the Silent Auction, please send a description of the item and the starting bid to Mouth of the Platte, Inc., via U.S. mail or email.

Lodging Information

Conference Hotel: The Embassy Suites, 555 South Tenth Street, Omaha, NE 68102. Phone: 402-346-9000 for reservations. Room rate for Lewis & Clark Annual Meeting attendees is $119.00 plus tax. Rate includes a full breakfast daily and is effective three days before and after the conference. Please identify yourself as an Annual Meeting Registrant. The hotel is located in the downtown area near the "Old Market", approximately five miles from the airport. Hotel shuttles are available from the airport on request.

More hotels and motels are available in the Omaha/Council Bluffs area. Google search "Motels Omaha" for a list.

Camping is available at NP Dodge Park, 402-444-4673, 11005 John J. Pershing Dr., Omaha, NE 68122, located approximately ten miles from downtown Omaha, or at Lake Manawa State Park, 712-366-0220, 1100 South Shore Dr., Council Bluffs, IA. Recreational Vehicle camping is available at Lake Manawa State Park and Bluffs Run RV Park, 712-308-5005, www.horseshoeaucouncilbluffs.com.
# 43rd Lewis and Clark Trail Heritage Foundation

## Annual Meeting Registration

Omaha, NE/Council Bluffs, IA 30 July - 3 August 2011

Additional registration forms are available at www.lewisandclark.org or www.mouthoftheplatte.org

### Registration Form (Please Print)

**Costs:**

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**Email Address:**

**Emergency Contact:**

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**Chapter Name:**

**Special Needs:** Diet/other (please describe):

**Camp Pomp Attendee:**

(Ages 6-18 yrs)

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(Use additional sheet for more than two participants)

**Registrants Attending Teachers’ Workshop:**

| Cost | $50 |      |

**Pre-Meeting Tour “A”:** Omaha/Council Bluffs, Thurs. & Fri., 28 & 29 Jul.

**Pre-Meeting Tour “B”:** Nebraska City, Sat., 30 Jul.

**Post-Meeting Tour “C”:** Northern Tour, Thurs., Fri., & Sat.; 4, 5, & 6 Aug.

**Attendance:**

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**Meals for Non-Registered Guests:**

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**Single Day Registration:**

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<td>Tues. 2 Aug., Bus Trip to Sioux City/Onawa, lunch only</td>
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<td>Wed 3 Aug., Ft. Atkinson, NPS, WHTC bus trip/ Lunch and closing banquet</td>
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### TOTAL COSTS SUBMITTED:

**FEES MUST BE PAID BY CHECK/MONEY ORDER TO:** Mouth of the Platte, Inc., P.O. Box 3344, Omaha, NE 68103

I plan to attend the New Member and First-Time Attendee Meeting on Sun., 31 Jul., 9:30 -10:30 a.m. □ Yes □ No

I plan to attend the Chapter Officers’ Breakfast on Mon., 1 Aug., 7:00 - 8:00 a.m. □ Yes □ No

I plan to attend the Past-Presidents’ Breakfast on Wed., 3 Aug., 6:45 - 8:00 a.m. □ Yes □ No

I am interested in the Bird Walk on Sun., 31 Jul., 7:00-11:00 a.m. □ Yes □ No

If interested in the Bicycle Ride on Sun., 31 Jul., 7:00-11:00 a.m., please contact bpaawloski@cox.net
The Carlile Shale “blue earth” facies can be technically described as a “very dark bluish gray.” It does appear distinctly bluish in outcrop.

Joseph Nicolas Nicollet, a French scientist, mathematician, and topographer, deduced this relationship following his April 4–June 12, 1839 retracing of Lewis and Clark’s route up the Missouri River. Nicollet stated that “many have erroneously supposed that volcanoes existed on the Upper Missouri. This, however, is a mistake. The smoke and pseudo-pumice... proceed from the same source, the ignition of the iron pyrites and lignite, which are found in great abundance in the plastic clay”. The American Journal of Science and Arts (October 1843), Vol. 45, pp. 154-155.

Although chemically identical to pyrite, marcasite has been found to oxidize more readily than pyrite due to its crystal structure (orthorhombic rather than cubic or isometric).

Seybert’s observation of efflorescence suggests he was seeing some kind of incrustation or powdery deposit on the surface of the specimens, which normally is comprised of an aggregate of halotrichite and melanterite; see Charles B. Sclar, “Decomposition of Pyritized Carbonaceous Shale to Halotrichite and Melanterite,” The American Mineralogist, Vol. 46, May-June 1961, pp. 754-756.

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Candidates for the true “burning bluffs” include the exposures that can be readily seen along 891 Road west-northwest of the Missouri River’s former confluence with Lime Creek and approximately 8,500-11,150 feet east-southeast of where Ames Creek emerges from the uplands.

51 Moulton, Journals, Vol. 3, p. 38. I wonder if the absence of the technical rock description of chalk in Clark’s Field Notes and Notebook Journal on August 26th (and Ordway’s and Whitehouse’s journals also) indicates that they observed a clay facies of the Niobrara Formation on August 26th or simply observed a chalk bluff from afar but did not get close enough to ascertain its true lithology until the next day.


59 Samuel L. Mitchell to Catherine Mitchell, December 30, 1806, Museum of the City of New York, folder 41.321.464. Due to Museum library renovations, Mitchell’s original correspondence was unavailable at the time of this article’s writing. Thanks to the admirable and meticulous research of Thomas C. Danisi and John C. Jackson in their book Meriwether Lewis, (Amherst, New York: Prometheus Press, 2009, p. 148), it was available in that excellent secondary source.


61 The Medical Repository was an eclectic journal that also published information and accounts of geographic explorations and scientific phenomena (along with a dash of “believe it or not” natural history and medical oddities).


63 Nicholas Biddle and Paul Allen, eds., History of the Expedition Under the Command of Captains Lewis and Clark, to the sources of the Missouri, thence across the Rocky Mountains and down the River Columbia to the Pacific Ocean, 2 volumes (Philadelphia: Bradford and Inskeep; and Abn. H. Inskeep, New York, 1814), 992 pages.

64 Further discussion of how the captains’ geological discoveries influenced subsequent scientific inquiry into the earth sciences in the nineteenth century can be found in John W. Jengo, “‘An Excellent Guide to Subsequent Explorers’: The Scientific Influence of Lewis and Clark’s Geological Discoveries,” We Proceeded On, Vol. 33, No. 3 (August 2007), pp. 6-17.
A Dog's Life in the Far West:
Speculation on the fate of the big Newfoundland that accompanied Lewis & Clark

BY JOHN C. JACKSON

As Captain of Infantry Meriwether Lewis prepared to launch an expedition to explore the Missouri River to its sources and continue on to the shore of the Pacific Ocean, he felt the need of a trustworthy animal companion. And so, before leaving Pittsburgh in the new keelboat, Lewis spent the large sum of twenty dollars to acquire a big Newfoundland dog. The financial investment entitled Lewis to naming rights over the animal, and he was given the name Seaman; possibly because of his composure on shipboard. One of the crew, John Colter, may also have suggested the name.

As the human crew struggled to work the heavy boat over shallows in low water, Seaman began his great western hunt rather modestly. The dog was adept at pursuing and taking grey squirrels caught swimming across the river.

I made my dog take as many each day as I had occasion for, they wer fat and I thought them when fryed a pleasent food — many of these squirrels wer black, they swim very light on the water and make pretty good speed — my dog was of the newfoundland breed very active strong and docile, he would take the squirrel in the water kill them and swimming bring them in his mouth to the boat.

After this difficult start to their journey, the crew was given a short rest when they arrived at Cincinnati. Lewis used the opportunity to visit a notable archeological dig across the river in Kentucky. The Big Bone Lick had already produced a number of specimens of prehistoric creatures. While his master collected samples for President Jefferson, Seaman must have thought he had found dog heaven.

Others also appreciated Seaman. Just above where the Ohio River entered the Mississippi, Lewis mentioned an offer he received on 16 November 1803.

we found here som Shawnees and Delewars incamped; one of the Shawnees a respectable looking Indian offered me three beverskins for my dog with which he appeared much pleased, the dog was of the newfoundland breed one that I prised much for his docility and qualifications generally for my journey and of course there was no bargan, I had given 20$ for this dogg myself —

The journals kept by members of the expedition contain ten references to the big dog that accompanied hunters or hikers along the shore of the Missouri. It was Sergeant Ordway who revealed the animal's name on 14 July 1804.

passed a handsome Sand beach on the South Side, where we Saw three large Elk the first wild ones I ever Saw. Capt. Clark & drewyver Shot at them, but the distance was too long, they Ran or trotted in to the River and Seamon Swam across after them

Seaman had many friends among these corpsmen so far from home; he was an unusual and favored example of his kind. When the tribes along the river wanted to welcome the travelers, they were likely to serve a special delicacy, an ona'gun [large bark bowl] of stewed meat. A small paw might be draped over the edge to make a presentation worthy of a modern chef. Packs of half-wild dogs shared the river villages and camps, sometimes threatening strangers. Larger ones were used to pull dog trains or toboggans when snow became too deep to allow hunting on horses. These working dogs were an essential part of tribal life. But that did not protect others from going into the cook pot when necessity or ceremony required.
The expedition soon adopted this pragmatic attitude to canines. As they passed down the Snake River in Nez Perce country, Sergeant Ordway recorded the purchase of “Some Sammon and 8 or 10 fat dogs &c.” Sergeant Gass enlarged on that.

Here we got more fish and dogs. Most of our people having been accustomed to meat, do not relish the fish, but prefer dog meat; which, when well cooked, tastes very well.5

Another of the non-com journalists, Private Whitehouse, also contributed evidence the Corps of Discovery obtained dogs to augment their diet.

...we roed 30 miles this day and Camped at a fishing Camp of Indians on the S. Side where we bought 3 or 4 more dogs and Some Sammon &c.

Simple arithmetic shows that the ever-hungry men of the Corps of Discovery were consuming as much, or more, dog meat as salmon.6 There was an important reason behind this choice. As they moved down the Columbia River, the travelers saw several places along that major fishery littered with hundreds of dead or dying salmon. When the British trader David Thompson arrived on the upper Columbia a little later in 1807, local Kutenai Indians warned him against letting his dogs eat raw salmon. Three dogs died slow deaths before Thompson got the message.7

Large numbers of dogs were present on the river in this period; coming upriver in 1813, a fur trade brigade acquired a hundred and fifty dogs from the villages and fishing camps between the Walla Walla and mouth of the Snake River. At another time, forty dogs were purchased from the Okanagans, taken across the river and slaughtered as traveling rations for a packhorse brigade traveling overland to Spokane.8 It is mystifying how the fishing villages were able to deal with the persistent problem of tainted fish while also maintaining packs of hungry dogs for food and labor.

On 11 April 1806 the expedition was struggling to cross the Cascades Portage and found the local Indians insulting. The location was a choke point, where local Indians expected to collect a passage toll. Later fur brigades were attacked on several occasions at this place.

many of the natives crowded about the bank of the river where the men were engaged in taking up the canoes; one of them had the insolence to cast stones down the bank at two of the men who happened to be a little detached from the party at the time...on the return of the party in the evening from the head of the rapids they met with many of the natives on the road, who seemed but illly disposed; two of these fellows met with John Sheilds who had delayed some time in purchasing a dog and was a considerable distance behind the party on their return with Capt. C. they attempted to take the dog from him and pushed him out of the road. he had nothing to defend himself with except a large knife which he drew with an intention of putting one or both of them to death before they could get themselves in readiness to use their arrows, but discovering his design they declined the combat and instantly fled through the woods.

In this case, the dog in question was meant to be dinner. But matters became more serious when several larcenous Indians tried to take Seaman. It is clear he had a different, higher status within the expedition than the dogs they had purchased for food along the way. He was a valuable member of their group, and was treated as such.

three of this same tribe of villains the Wah-cle-lars, stole my dog this evening, and took him towards their village; I was shortly afterwards informed of this transaction by an indian who spoke the Clatsop language, [NB: some of which we had learnt from them during the winter] and sent three men in pursuit of the thieves with orders if they made the least resistance or difficulty in surrendering the dog to fire on them; they overtook these fellows or rather came within sight of them at the distance of about 2 miles; the indians discovering the party in pursuit of them left the dog and fled.9
As Lewis's small party ascended the Blackfoot River following the Salish Road to the buffalo, they assigned Seaman's name to a river coming in from the high mountains to the north. That is how it appeared later on Clark's 1810 map. However, Gary Moulton, among others, has speculated that the big dog was not with Lewis and the three men who later rode north to reconnoiter the headwaters of Maria's River. As Richard Dillon declared in his Meriwether Lewis: A Biography, the four compatriots, fleeing from the site of their fateful confrontation with the Piikani, covered 120 miles in 24 hours of hard riding after the incident. It is unlikely that a big dog could have kept up that punishing pace. It is more likely that Seaman remained with others at the Great Falls portage, and rode on in the boats until the parties reunited at the mouth of the Marias.

At the end of the expedition, the Corps of Discovery was disbanded in St. Louis. The two leaders went on to Washington, where official duties were unlikely to allow proper care of a dog. In any case, by then Lewis's twenty dollar dog was almost the communal property of the entire expedition. Which man or men, then, took him on? There are several potential candidates.

The first, and most likely, case is that Seaman was left in St. Louis with the expedition's former hunter George Drouillard. By the following spring, several former expedition members joined the trading and trapping party of the fur entrepreneur, Manuel Lisa. George Drouillard went along to represent the interests of his debt holders and Lisa's investors, William Morrison and Pierre Menard. As he started up the Missouri River in May 1807, he may have taken Seaman with him. The dog was a proven hunter, at home in the wild, and a good mascot for a large group of men. Later in the year, when a post was completed at the mouth of the Big Horn River, Drouillard was free to circulate en derouine to drum up trade with the winter-scattered Crow Indians. Traveling alone through the Big Horn Basin, making winter camps and compiling geographical data, Drouillard would appreciate a trustworthy canine companion.

After Drouillard's explorations during the winter 1807-08, Seaman may have been left at Fort Remon when Lisa and Drouillard left to return to St. Louis on the keelboat. In St. Louis Drouillard took his findings to Governor Meriwether Lewis and Western Indian Agent William Clark. Neither officer was sentimental enough to mention a reunion with a faithful old friend. Drouillard may have kept Seaman with him on the second expedition or found him in the care of the surviving former corpsmen at Fort Remon. In the spring of 1810 they proceeded to the Three Forks. (More about this fateful excursion later.)

Another possibility is that Seaman went with John Colter, John Potts, Peter Weiser and others, when some time later they trapped along the Yellowstone River and across to the Three Forks of the Missouri. However this scenario is not as probable, given an incident along a branch of the Jefferson Fork. Colter and Potts were trapping from a log dugout when they were intercepted by a Blood and Ahsiina party raiding south along the old North Trail. Potts panicked and was slain. Colter was stripped and given a sporting chance to run for his life. His captors believed he had drowned, and went home carrying his heavy military rifle -- the same firearm he had never turned in after the expedition. Colter hid under a raft of driftwood and survived. That the two had been working from tippy dugouts suggests that the big dog was not with them at that time, and he is not present in accounts of the encounter. Nor is Seaman mentioned as a working dog with the tribe later on, as he probably would have been if he had been taken at the same time as the rifle. Colter's heavy gun was not of much use to buffalo running plainsmen and the Bloods took it to British traders on the Saskatchewan River. On 2 and 12 October 1808, the Hudson's Bay Company inland master, James Bird, mentioned the rifle but said nothing of an unusual dog accompanying it.

An unusual dog answering Seaman's description does appear in a personal journal kept by the North West Company partner Alexander Henry. At Rocky Mountain House on the upper Saskatchewan during the winter of 1810 and 1811, he recorded the attacks made by disreputable Falls Indians (Ahsiina) on a party of Americans the previous summer. It took place at the Three Forks; the victims were an advance party of the reorganized St. Louis Missouri Fur Company, including Drouillard. They built a fort and began trapping despite the knowledge that Northern tribes were eager to attack and rob trappers. There was an attack on the first party that went out to take beaver. Later, the plainsmen struck Drouillard and two of his Shawnee kinsmen who were hunting deer and might very well have taken a dog to help.

When the raiders returned to the upper Saskatchewan in March they displayed "considerable booty", as Henry noted in a vivid journal entry.
Last summer these people upon a War excursion fell upon a party of Americans or Freemen from the Isbenois [Illinois]; they confess to have murdered them all, and brought away a considerable booty in utensils Beaver Skins &c. Some of the Beaver Skins I observed were marked [Francois] Valley and Jnumell [Michell Immell] with different numbers 8, 15 7ec. I purchased from a Fall Indian [Atsiina] a Dog which he had taken upon that occasion, a stout Black Dog, of a breed between a Hound and Newfoundland Dog. I was really surprised at the docility of this poor Animal; he would not allow himself to be attached to a sled, to haul any weight on their way in. He was therefore allowed to come in perfectly light and free. But upon his arrival at my house, he came in without any ceremony, looked about, jumped and frowned upon the whole of us and would not return to the Indian Tents. His master was under the necessity of taking him away tied with a line, and kept him inside of his Tent tied to a Tent Pole, where a large Wolf Skin, was always spread for him to lay upon. On their going away I purchased him from them for a fathom of Tobacco and a Sculper. The poor beast really seemed rejoiced and happy to remain with us.

The Blood Indians had been at War upon the Missouri nearly about the same time the Fall Indians. They also fell upon a party of Americans and murdered the whole of them, and brought always a considerable Booty...From the description the Blood Indians gave of the dress and behavior, one of the party whom they murdered must have been an Officer or a Trader. They say he killed two Blood Indians before he fell. This exasperated them very much and from what information I could collect, I have every reason to suppose they butchered him in a most horrid manner, and even ate him, some Raw, and others Boiled. They say his Skin was exceedingly White, and tattooed from the hip down to the feet.15

James Bird heard a similar story from his men at Acton House, the Hudson’s Bay Company’s nearby post. His man MacFarlane had arrived from Acton, where William Flett remained to keep the Piegans friendly toward Joseph Howse as he traded in the Salish Country. Bird wrote that the Muddy River Indian chiefs:

...had promised not to molest Joseph Howse on his return for the Flat Head Country but declared that, if they again met with a white Man going to supply their Enemies they would not only plunder & kill, but they would make dry meat of his body.

Bird believes the threats because of attacks on

...three American settlements on Missouri last summer [or made three attacks on the same settlement] and killed most of the men, roasted the body of the principle American [Drouillard] and ate it with the most savage Exultation.16

Of course, speculation about a connection between the big Newfoundland dog that Henry bought from an Atsiina and Drouillard’s death is purely circumstantial.17 But Henry was a reliable journalist, and had no reason to enlarge on facts. As has been shown, it is possible to easily link the slain Drouillard to the captured dog, and the description Henry gives of the animal is remarkably similar to that of Seaman. If Drouillard took Seaman with him up the Missouri in May 1807 or later in spring 1809, the hunting dog would have been with him when he was killed.

That only leaves the question of what became of Seaman after Alexander Henry bought him in 1811. Henry had his family with him at Rocky Mountain House, and a clerk named Angus Bethune. Henry apparently remained at Rocky Mountain House, or at other Saskatchewan posts, until he was reassigned to the Columbia Department of the NWC in 1813. Bethune soon followed. When Henry’s party overtook his old acquaintance James Bird coming up the Saskatchewan, they exchanged visits. Neither mentioned a large dog traveling in the two birch bark canoes. The animal probably passed, with responsibility for Henry’s widow, to John Rowand, after Henry’s death in May 1814, or to some trustworthy person who promised to refrain from trying to use him as a sled dog.

That may not be the ending school children or pet lovers might prefer to see of this dog’s tale. Sentiment
never ranked high on the thin edge of western survival. In Seaman’s interests, let it be made clear that it was no small accomplishment for an unusually large dog of this period, or any other, to make two trips across the continent and one from the upper Missouri to the Saskatchewan. He deserves our respect, and remembrance, as a great American dog.

John C. Jackson of Olympia, Washington is the author of five books on the history of the Pacific Northwest, including The Piikani Blackfeet: A Culture Under Siege and Jemmy Jock Bird: Marginal Man on the Blackfoot Frontier. He is the coauthor with Thomas Danisi of Meriwether Lewis. His latest study, By Honor and Right: How One Man Boldly Defined the Destiny of a Nation, takes up in 1807 where the Lewis and Clark expedition left off.

Notes
1 The breed was developed on the northeast coast to aid fishermen in spreading and hauling. http://dogbreedinfo.com/newfoundland/origin (accessed 1/7/2011)


6 Entries of 23, 28 and 29 October show purchases of 25 dogs.


11 25 July 1806, n.5.


14 Edmonton House Journal, Hudson’s Bay Company Archives, B60/a/8, fol. 4-4d.

16 Edmonton House Journal, 13 May 1811, HBCA B60/a/9, fos. 13-13d; James, Three Years, 46 gives a graphic description.

17 In her book Lewis and Clark and Me: A Dog’s Tale (New York: Henry Holt, 2002) Laurie Myers reports that Lewis and Clark scholar Jim Holmberg found an 1814 book that listed epitaphs and inscriptions. The book includes a dog collar in a museum in Virginia, whose inscription reads: “The greatest traveller of my species. My name is SEAMAN, the dog of captain Meriwether Lewis, whom I accompanied to the Pacific ocean through the interior of the continent of North America.” Holmberg’s research was also published in the February 2000 issue of We Proceeded On.
The Expedition's Dutch Ancestor:

New research examining Adriaen van der Donck

by Sam Carr

As part of a new occasional series outlining current research-in-progress of interest to WPO readers, we bring a brief précis of the career of Dutch explorer Adriaen van der Donck. This seminal predecessor of Lewis and Clark is at last being seriously considered as an early lost model of fair and interested European interaction with Native American tribes.

When a young Dutchman named Adriaen van der Donck arrived at New Amsterdam in 1641 Jamestown had been established for a full generation. But van der Donck would prove to be a century and a half ahead of his time, for not until President Jefferson's commission of Lewis and Clark's expedition would the landscape and native peoples of North America be viewed with an interest and enthusiasm equal to the Dutchman's. The English, and their cultural progeny, for all their dominance in the region, would allow fear to taint their understanding of the natural world until imported Continental European philosophies would teach them to see otherwise. Many decades Later the Enlightenment would bring a profoundly appreciative change to Americans' view of their landscape; but for van der Donck in 1641, it was a matter of honest observation and engagement.

All but forgotten until Charles Gehring began his groundbreaking New Netherland translations in 1974, van der Donck ensured the survival of the fledgling colony by bringing an end to the vicious and pointless war begun by the Dutch West India Company-appointed Governor Kieft against the native tribes of the region, populated by the Lenape and Mahicans, though the latter were driven south by the Mohawks as colonist and native came to peace, as the Mohawks saw a chance to complete their monopoly of the Dutch fur trade from the Adirondacks to the mouth of the North (Hudson) River. Van der Donck's efforts saw the tribes become established trading partners, reversing much of the damage done by Kieft. As with later interactions, however, initially friendly relationships would cool, and then sour completely, descending into intermittent, nightmarish violence epitomized by the massacres of women and children by both factions. Van der Donck himself was likely killed in one such outburst, though it is impossible to know for certain—even within his own lifetime his integral role was being lost to history.

While Lewis and Clark were commissioned by an elected and recognized national leader, van der Donck undertook his explorations largely outside of his official role as van Rensselaer's schout, essentially an attorney-general for Rensselaerwyck, the merchant's personal colony. His fascination would prove so overwhelming that van Rensselaer would eventually refuse to renew his contract, essentially firing him. His contribution to the literature of the New World, A Description Of New Netherland, proves today an invaluable record of what the North-East was before it was widely colonized, and serves in many ways as a precursor of the reports Lewis and Clark would eventually bring back from their own explorations. A striking aspect of his observations is the total lack of fear often found in pre-enlightenment descriptions of wilderness. There is no evil, no supernatural element at work in the primeval forests, only vast opportunities.

From Columbus onward tall tales of the New World were crowd-pleasers—even Shakespeare got in on the act with The Tempest—and for van der Donck, enticing settlers to his adopted home meant dispelling the darker myths of Calibans and ship-swallowing storms. His book is an invaluable record of the world he
saw, but is also filtered to be what he wanted others to see. He persistently describes the natives and non-hostile, an exaggeration belied by the bloody wars that would have dominated the news returning to Amsterdam. “The Indians are notably melancholy, unaffected, calm and of few words,” he writes. “If a few have a different disposition, that does not upset the general rule. The little they do say is long considered, slowly spoken, and long remembered.” Evidently, he was attempting to undo the potential damage done to the colony by being surrounded by people known back home largely in the context of wars with European settlers.

Van der Donck’s primary motive for writing a description of the new region was to entice Dutch settlers; he saw from the very start, as did virtually every European traveler from Henry Hudson onward, that the natural features of what would become New York State could support a large population, (although it’s probably safe to say that today’s eight and half million permanent residents in New York City would have been viewed with a healthy dose of skepticism.) Lewis and Clark, a century and a half later, would be carrying on in his tradition, without ever knowing the man had existed. Both sets of reports sought to confirm or deny the various contradictory reports that had trickled into the public realm from fur traders, explorers and publicity seekers.

While van der Donck’s descriptions reflect his close contact, indeed his personal relationships with individual tribes and their elders, his motives in description are by no means purely humanitarian, for the fur trade that drove the colony’s economic engine relied almost entirely on trading with the Mohawks, and a peaceful relationship with them promised wealth for the settlers as well as safety. He also talks in some depth about their methods of warfare, but also goes to great pains to humanize them, addressing subjects that would have been of no small import to his intended readership. Their religious beliefs (and interest in being converted to Christianity), their views of God and the Devil, the afterlife, systems of government and forms of currency are all addressed in some detail and with the same candor as the quality of the soil or the predominant flora and fauna.

Within twenty years of van der Donck’s death New Netherland would become New York, and while the legacy of the early Dutch colonizers would dictate to a very large extent the liberal, tolerant city New York would grow to be, individual achievements such as van der Donck’s would be largely forgotten, and those figures that remained in the public consciousness quickly became caricatures like the peg-legged and violent tempered Governor Stuyvesant.

Men like van der Donck, who resist easy stereotyping, are less attractive to historians. His compatriots were in no position to eulogize the fallen, life in the colony was precarious, and there was little time for veneration, or perhaps even appreciation. Van der Donck was instrumental in having a deeply unpopular governor removed from office, and yet the same men who benefited from that action failed to record van der Donck’s death. His counterparts a century and a half later would almost instantly be written into the pantheon of American folk heroes; for the Dutchman who preceded them, recognition has only come with a new kind of exploration—the archival rediscovery of an integral chapter of early American history.

Mr. Carr is a writer and historian based in New York City.

Further reading
The Colony Of New Netherland, Jaap Jacobs, Cornell University Press, 2009
The Island At The Center Of The World, Russell Shorto, Vintage, 2005
A Description Of New Netherland, Adriaen van der Donck, University Of Nebraska Press, 2008

Notes
1 While his name was lost, his extensive property would take on an anglicized form of his honorific, Johnkeer—modern Yonkers, a suburb just north of modern New York City’s northern border.
Lewis and Clark in Other Media

Dick Kodeski is retiring as monument manager at Pompeys Pillar National Monument. He turned 62 in June. He has more than 35 years of federal employment service.

It seems as though Kodeski is as much of a fixture at the monument as the rock that William Clark made famous in his journals when he scratched his name in the sandstone in July of 1806, while returning to meet up with Merriweather Lewis. Clark noted in his journal that the pillar was a “remarkable rock” that provided an “extensive view in every direction.” The inscription he left is the only remaining on-site physical evidence of Lewis and Clark’s epic journey through the Northwest. Clark named the rock Pompey’s Tower. It was later renamed Pompeys Pillar in the Biddle version of the Lewis and Clark Journals in 1814. Clark took the name “Pompy” from his nickname for the young son of the expedition’s Indian interpreter, Sacagawea, Jean Baptiste Charbonneau. One theory is that Pomp means “little chief” in the Shoshoni language.

The pillar rises 150 feet from its base on the floor of the Yellowstone River valley. It has a long history as an observation point for at least the past 11,000 years. Pompeys Pillar National Monument sits on a 431-acre parcel of property 44 miles east of Laurel, off of I-94 at exit 23. It is open seasonally from April 30 through Oct. 15. Kodeski was the first monument manager, appointed in 1992 after the property was purchased by the U.S. Bureau of Land Management (BLM). He began his federal career in 1973 as a seasonal fire fighter with the National Forest Service. He fought fires during the summer and was a ski instructor during the winter months. He had applied for a planning position with the BLM and never heard back on the job. He went to work for the Utah State Parks and out of the blue, he was called back by BLM and moved to Sun Valley, ID. While in Idaho, he worked developing recreation sites. He moved to Montana in 1985 and did land use planning out of the BLM office in Lewistown.

“I’ve enjoyed my federal career,” he said last week, as he began cleaning out his desk at the Pillar’s Visitor’s Center.

“No two days have been the same.”

Kodeski grew up in Niagara Falls, NY. He attended forestry school in New York and came west to study wildlife management at the University of Wyoming. He later transferred to parks and recreation.

He said he will miss working with the public. He said development of the Pillar is the result of many hours of work by community volunteers. “My proudest achievement has been retaining volunteers who don’t have to be here and watching them successfully obtain national monument status for the Pillar.”

The national monument designation was approved by Congress in 2001. Then-Montana Congressman Rick Hill ushered the bi-partisan legislation through the Congress. Subsequently, funding was approved for a $6.7 million visitors’ center at the site which was completed in 2006.

Artwork by western painter J.K. Ralston, depicting the expedition, is displayed in the main hallway of the visitor center. The Ralston paintings are from the John and Stella Foote collection that BLM acquired at the time the pillar was purchased from the Foote family in 1991.

During the Lewis and Clark Corps of Discovery bi-centennial in 2006, the pillar hosted one of the signature events. It was one of only 15 commemorative events staged across the country. More than 50,000 people attended the event at the Pillar that was hosted with the help of 500 volunteers from the community. “I have been told by others who attended all 15 of the events that the events at Pompeys Pillar were the best,” Kodeski said with a small smile on his face. It was obvious he was proud of the volunteers he has worked with at the Pillar that staged the signature event.

“I’ll miss the people I’ve worked with here. Over time, you develop close relationships with the community, the
neighbors to the site, and folks involved with regional tourism."

Kodeski speculated the popularity of the site will continue to grow as people learn about it by word of mouth. "The last two summers, visitors answering satisfaction surveys have rated their experiences '100 percent positive' at the site. I attribute that to the volunteers' knowledge of the site and an always ready big Montana smile. People leave here satisfied with their experience," he said. "Few people have the chance to start with a blank canvas like I did here. That is a rare opportunity. I have enjoyed my time here and I'm sure I am leaving the site in the good hands of the volunteers who will continue to work here and support the site." Kodeski has been the only full-time permanent employee at the site. There is another permanent part-time employee and eight seasonal park rangers at the site during the summer. The visitor's center is staffed by 35 plus volunteers at the monument. The site has between 55,000 to 60,000 visitors annually.

Kodeski and his wife, June, plan to build a retirement home on property they own in the Flathead valley. His wife works for the US Bureau of Reclamation in Billings.

- Larry Tanglen, Managing Editor, Laurel Outlook Laurel, MT
Text and photographs appear courtesy of the author and newspaper.
Exploring New Worlds, Today and Yesterday

Voyager:
Seeking Newer Worlds in the Third Great Age of Discovery

Stephen J. Pyne
Viking, 2010
$29.95/444 pages

This book should fascinate readers who care about the Corps of Discovery, even though it makes only scattered references to Lewis and Clark and contains a couple of glaring errors about them. It weighs the motives, techniques, opportunities, and consequences of five centuries of exploration—from the first European ventures into the deep oceans of the world, to treks across all the continents, to rockets sent far into space.

The main narrative is a detailed account of the Voyager space program, which successfully launched two robotic missions to the outer limits of the solar system in 1977. Stephen Pyne calls this project the Grand Gesture of a new golden age. It has radically changed our understanding of Earth and the other planets, and it forces us to reconsider what exploration itself means now and has meant in the past.

More generally, Pyne outlines three great ages and their corresponding Grand Gestures. The first was the age of navigators, who pressed beyond coastal sailing and island hopping to discover the full dimensions of one great ocean. The culminating voyage was Magellan’s circumnavigation of the globe. The second age was the scientific mapping of continental interiors and the development of empires. For North Americans, Lewis and Clark’s exploration “was the defining moment of the new age” (p. 66).

Both the Voyager program and Corps of Discovery were distinctly American projects, sponsored by the federal government, popular in their appeal, with scientific and patriotic objectives, designed and executed in similar ways. Pyne traces their heritage of exploration back to European nationalism and fantasy and forward through Cold War rivalries and scientific turf battles. Each stage of the decades-long Voyager project leads him into meditations on such topics as national prestige, colonization, geographical mythologies, technological innovation, luck, daring, funding dilemmas, strained preparations, encounters with the unexpected and unexplainable, failure and re-adaptation, public acclaim and indifference, and the consequences of seeing the world in new terms in successive generations.

Pyne makes rocket science intelligible for a lay reader and writes confidently about scores of earthly adventurers. His earlier books about fire on several continents and about the exploration of Antarctica have prepared him to balance technical accuracy with a keen sense of metaphor.

His glaring errors? Somehow he has the impression that keelboats “had a length of fifteen feet and a width of ten” (p. 54) and that no Lewis and Clark records were published until a century after their return (pp. 237, 276). But these are small matters in a study that covers all of modern history, billions of miles of rocket trajectory, and questions that are cosmic in every sense.

Albert Furtwangler

Albert Furtwangler, a member of the Oregon Chapter, is a retired professor of literature and a longtime member of the Foundation and contributor to WPO. He has written three books and many articles about Lewis and Clark and other figures in early Western America, including Acts of Discovery (1993) and Bringing Indians to the Book (2005).
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Look forward to evenings when you will join Barb and Ella Mae around the campfire to talk about Lewis and Clark, and those who came later to this remarkable country like the steam boaters and the homesteaders.

Come prepared to eat marshmallows roasted over the campfire and sing the wonderful old song made famous by Gene Autry—“Don’t Fence Me In.”

For trip details and costs visit: www.rowadventures.com/Canoe-Adventure-Montana-Missouri-River
or email: candye@rowadventures.com
or email: ella@rowadventures.com
or email: ella@rowadventures.com
or call 800-451-6034.

Barb and Ella Mae with the help of ROW (River Odysseys West) are doing this trip for the benefit of the Lewis and Clark Trail Heritage Foundation’s Bill Sherman Library. Five hundred dollars of the cost of the trip will be donated directly to the library. The Bill Sherman Library has an extensive collection of Lewis and Clark materials, including some of the very early editions of the journals.

ROW is one of the most respected outfitters on the Missouri River, doing trips since 1998. ROW provides all the equipment including top-notch camping accommodations and gourmet dining. Camp is set up by the crew prior to your arrival. River travel is in a 34’ canoe which means you can paddle if you want or you can just kick back and enjoy floating down the river. People from 5 to 87 have enjoyed this trip.

Barb and Ella Mae are passionate about the Lewis and Clark story and love to share their passion with others. Both have written books about Lewis and Clark. Ella Mae has been doing this trip since the early ’80’s. They are volunteering their time in support of this trip.

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The Long View: Teaching as an Act of Faith - Can One Person Really Make a Difference?

Teaching is an act of faith. I hope and pray that all students will mature and grow into productive citizens. Hopefully I provide them with the intellectual means, social skills, and caring attitude necessary for success in today's rapidly changing world. Nevertheless, how would I (or any teacher) ever know for sure whether or not every student reached his or her full potential? The answer is, you usually don't know for sure.

Having said this, however, there still are occasions when a teacher stumbles upon a former student and discovers that the student retains a positive impression from the old days. What about all students though? Do they all remember what I taught them? Then, again, there are those moments when, without any warning at all, something happens which affirms and reminds me about why I became a teacher in the first place (i.e. to make a positive difference by serving others). One such magical moment in my teaching career occurred a few years ago that left a most enduring impression and has helped shape me as a teacher.

It was a Saturday morning and, as usual, I had been up since daybreak grading papers in my home office. At the time, my wife and children slept late on Saturdays but I found the early morning hours tranquil and productive, especially with family matters to deal with the rest of the weekend. Anyway, I was still grading papers at 9:30 A.M. when I received a long distance phone call from Philadelphia. George, a former American history student, was on the line and he just wanted me to know where he was.

It took a minute to place George because it had been four or five years since he had graduated and, as far as I could remember, I had not established a particularly strong relationship with him in class. On the other hand, it is amazing that after teaching approximately 4700 students I can still pull a name from my memory bank every once in awhile. Such was the case with George.

I knew that he sat in the second row, last seat, on the left side of the room. I knew that he lived near a local lake and loved to water ski barefoot. I did not know, however, that he had enlisted in the United States Navy and was stationed in the City of Brotherly Love. After exchanging pleasantries, he finally told me that he was sitting in the American Philosophical Society just a short distance from Independence Hall.

Immediately I knew what he was doing there but I couldn't believe it. Obviously, while studying the Lewis and Clark Expedition (one of my favorite topics), he had remembered me saying that the original journals were under lock and key in the American Philosophical Society. He must have seen my slides of me studying at the society and actually using the original journals as part of my independent study grant one summer. The journals are priceless and George knew they were important to me. Thus on his day off, he had talked himself past the secretary and security and into seeing the journals for himself. Not only did he use my name, but he also followed researchers from UCLA into the vault area where the journals are protected as priceless documents.

I talked with George for more than 30 minutes. (Note: This was before the time of unlimited long distance or free cell phone minutes on weekends!) My wife woke up and wanted to know who was on the phone. There was no way I could adequately respond at the time because I had tears of joy in my eyes.

Whenever I question whether or not I have a positive impact upon students or if my career is really that important, I think of George. The same is true when a mother informs me that I am her daughter's favorite teacher and that I must have a "calling" to teach. When a father seeks me out at a school function in order to bring me up-to-date on his son who still talks fondly about my class, I think of George. When a former student prepares for her wedding and asks that I join her for the father-daughter dance because her father has passed away, I think of George.

Yes, teaching is, indeed, an act of faith. Teachers always must be cognizant of what they say and how they act because they truly do make a difference. I can never forget that. George won't let me.

Stan Spencer

Stan Spencer, a founding member of the Ohio River Chapter, retired in 2010 after teaching for 41 years on the middle school, high school, adult education, and collegiate levels. During his career, he was named "Outstanding Social Studies Teacher" and was a finalist for "Teacher of the Year" in Michigan. His comments here served as his farewell address to a class of prospective social studies teachers at Grand Valley State University.
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- Dr. Clay S. Jenkinson
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