

# LEWIS & CLARK IN COLUMBIA RIVER COUNTRY



## LESSON PLANS / MIDDLE SCHOOL

### Math of the Path: Students Calculate Data from the Lewis & Clark Journey

by [Darin Detwiler](#)

#### Summary:

We cannot possibly take a class of students to walk the entire length of the Lewis and Clark trail just for a math lesson. The paperwork alone would prove more challenging than the journey.

In this lesson, students will embark on a journey of the mind as they use measurements and calculations from a path at their school to compare with data from the path of Lewis and Clark's Corps of Discovery.

#### Essential Questions for Students:

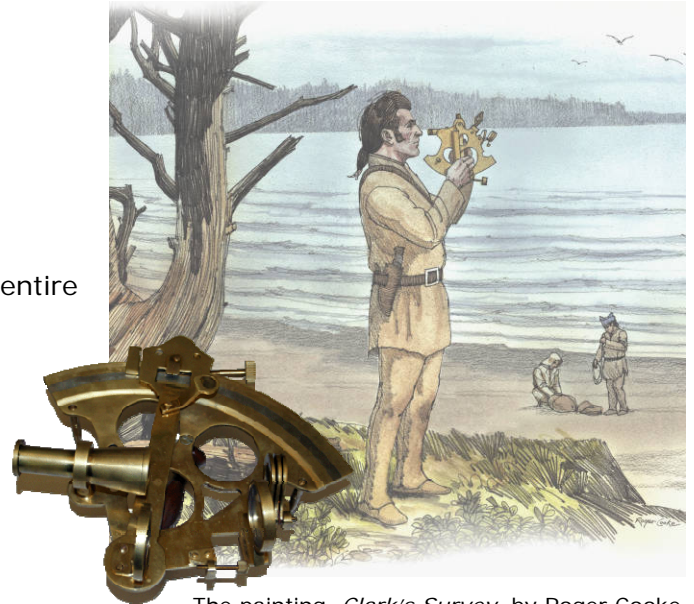
- How did Lewis and Clark and the CORPS OF DISCOVERY travel on their journey?
- What route did they take?
- How long was the distance they covered?
- How much distance did the group travel in a day?
- What geographical features or forces impacted the group's speed?
- What was the average speed of the group?
- What is the average speed of students walking the distance of a school hallway?
- How does the travel speed of the Lewis and Clark expedition compare to that of students?

#### Essential Understandings:

- Students will predict and measure distances of different areas in their environment.
- Students will identify and/or calculate the minimum and maximum values, mean, median, and mode for a set of values.
- Students will collect data to make calculations and critical comparisons between their environment and that of the Corps of Discovery.

#### Essential Academic Learning Requirements (EALRs)

This lesson plan satisfies the following EALRs: History 2.2.2, and US 1.2.2, Geography 1.2.2a, Mathematics 3.1.1, 3.2.1, 3.3.1 and Reading 3.1.1 as well as Science 2.1.3 and 2.1.5. [Click here](#) to print out the material for your reference.



The painting, *Clark's Survey*, by Roger Cooke shows William Clark looking at the ocean by using a sextant (device pictured left). Washington State Historical Society Collection.

#### DOWNLOAD AREA

Download the PDFs required for this lesson plan

[The Lesson Plan](#)

[Primary Source Documents](#)

[Secondary Source Documents](#)

[Student Worksheets](#)

[Other Teacher Materials](#)

### Method:

Students will work with predictions, data collection from a known path, data from the journey of Lewis and Clark, and geographical information. They will apply this data to complete a worksheet and a map of the journey.

### Primary Sources for Student Examination (provided):

1. [1806 Lewis and Clark map detail](#)
2. [1803 map of Northwestern territories](#)
3. [Lewis and Clark journal excerpts](#)

### Secondary Sources for Student Examination (provided):

1. [The Vote: Station Camp, Washington](#) reading excerpt

### Teacher Reading (provided):

1. [Sold our Canoes for a Few Strands of Beads](#) reading

### Materials Needed:

1. Tape Measurers, calculators, stopwatches, pens, colored pencils, map of North America, black-line master outline of North America for every student, copies of [worksheet](#) for each student.
2. (Optional) trundle wheels, clipboards, globes, various maps of North America.
3. (Optional) Instructional Technology: Digital Camera, Computer, LCD projector, ActivBoard (or Smart Board,) TI Emulator, internet access, video(s) on the Lewis and Clark journey.

**Primary Sources:** A piece of evidence created during the time period under investigation by someone who participated in, witnessed, or commented upon the events that you are studying. It is the surviving record of past events such as photographs, diaries, or artifacts.

**Secondary Sources:** Books, articles, essays, and lectures created, often using primary sources that describe and interpret a time period after events

**Secondary Sources:** Books, articles, essays, and lectures created, often using primary sources that describe and interpret a time period after events have taken place.

### Instructions for Teachers:

#### PREPARATION

Schools typically have a main hall or corridor. Maybe yours begins at the school's main entrance or passes along the main office. Any significant or symbolic distance will work for this activity: the perimeter of the gym or field, or the distance between the classroom and the library or lunchroom. Whatever you as the teacher choose to use for the class, the choice to use a defined and very public distance will allow for students to better identify and communicate the distance traveled by the Corps of Discovery during their journey.

Note: Students should have been introduced to the history of Lewis and Clark prior to this lesson plan.

One idea is to use this activity in a math class in conjunction with a history class unit on Lewis and Clark.

Prepare yourself for the discussion of the journey by reading about Lewis and Clark's journey on the Columbia River. The website, <http://WashingtonHistoryOnline.org/L&C-columbia/index.html>, offers various lesson plans and readings if you wish to provide them for your students. You will be discussing not only the distance traveled by the explorers on their journey but also the methods by which they traveled. As you read, consider the various means of travel that the Corps of Discovery utilized on this expedition and be prepared to communicate that variation to your students.

### THE JOURNEY OF LEWIS AND CLARK by the numbers

1. The journey westward and back took place May 14, 1804 – Sept. 23, 1806.
2. The journey took two years, four months (28 months) to complete.
3. The length of the journey was approximately 7500 miles (12,075 Kilometers.)
4. They crossed through 11 of today's states.
5.  $7500/28 = 268$  miles per month = 67 miles per week = about 10 miles per day! (However, they did not travel every day, nor did they travel 10 miles every day.)

Sold Our Canoes for a Few Strands of Beads

The Vote: Station Camp, Washington

The following terms should be understood and/or defined by students either early in this activity or before this activity:

TERM / CONVERSION	DEFINITION
Speed	The amount of time required to travel a distance
Average speed	Total distance traveled divided by the total time required to travel that distance
Inches to feet conversion	12 inches = 1 foot
Feet to miles conversion	5280 feet = 1 mile
Seconds to hours conversion	3600 seconds in 1 hour

## SESSION ONE

### Part I.

Explain to students that during this lesson plan they will be examining the distances traveled by the Corps of Discovery and their methods of transportation. Project the maps provided to remind them of the route of the Corps of Discovery and of their contribution to charting a relatively unmapped area.

1804 map of Northwest territories by Nicholas King

1806 map (detail) by Meriwether Lewis and William Clark

Tell them that they will be undertaking their own expedition by walking across an area in their school and using those measurements to record distances and walking speed. They will then take their classroom journey and compare it with the one made by Lewis and Clark.

### Part II.

Ask students to brainstorm a list of items (natural or man-made) that are not easily measured due to extreme lengths. Some possible suggestions could be the Columbia River, the Great Wall of China, the Mississippi River, the distance between Seattle and Hollywood, etc. This collection could be done on a chalkboard or white board or by using a computer/LCD projector/ACTIVboard (or Smart Board).

Pick one distance (or add one) for which you have the actual length and have students guess the length. Record the guesses and identify the minimum and the maximum values, then work with students to identify/calculate the mean, median, and mode. Then reveal the true length (or use the internet as a class to find the length.)

#### Sample Distances

The distance from Seattle to Hollywood: 1137 mi.

The length of the Columbia River: 1240 mi.

The length of the Mississippi River: 2340 mi.

The length of the Great Wall of China: 4161 mi.

The length of the Pacific Ocean (from north to south): 9630 mi.

### Part III.

Have the students predict the length of the hallway you have chosen to measure. This can be done in any units, most likely feet and inches. You may wish to record the predictions on a graph or number line. This graph or number line can be projected on a screen or written on a chalkboard or whiteboard.

Identify the minimum and the maximum values, then work with students to identify/calculate the mean, median, and mode. Ask students to record this information to use below as part of the homework assigned.

#### Part IV. (Homework)

Have students take their recorded values home and create either a **box and whisker plot** or a **stem and leaf chart** with the predictions. Instructions can be printed from the links below.

Box and whisker  
plot worksheet

Stem and leaf chart  
worksheet

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### SESSION TWO

#### Part I.

Refer back to the predictions and calculations from day one. Ask students if anyone went to the hallway and looked at it to confirm the estimated lengths.

Collect the tools your students will need to complete the data collection: something to write with and on, measuring tapes, and stopwatches. Assign the roles of measurers, timers, recorders, and walkers.

#### Part II.

Proceed with students to the hallway. Instruct students to measure the length of the hallway. Use the same units that you had students use to predict the measurement. You will want to have five or six trials for accuracy.

Have walkers and timers position themselves on opposite lengths of the hallway. With a wave of the hand, readied timers will signal the start of the clock for walkers to begin a normal-walking speed pace along the measured distance. In order to prevent speeding or racing, have walkers complete their lap one at a time.

Collect distances and times, all the tools, and your students and head back into the classroom.

#### Part III. (Optional)

Use this opportunity to take pictures of students at work.

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### SESSION THREE

#### Part I.

Revisit the data that was collected. The data can be shared with all students by one of these various means:

- Collect all data after day two and record onto one sheet by hand or by using a spreadsheet. Copy enough data sets for students to have an individual or a small group handout.
- Collect all data after day two and record onto one large poster or piece of butcher paper. Make sure to use large letters and numbers. Attach to the wall. Students can gain the needed data from the poster.
- Collect all data after day two and record onto one sheet by using word processing program or a spreadsheet program. Project onto a screen using an overhead projector.
- Collect all data after day two and record onto one sheet by using word processing program or a spreadsheet program, then project using CPU/LCD projector/ ACTIVboard (or Smart Board).

#### Part II.

Work with students to complete the worksheet provided. Computer/LCD projector/TI Emulator could be used to demonstrate calculator use while class is completing the worksheet.

Near the end of class, regroup and spot check student performance. Collect and grade papers for students to use on day four.

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### SESSION FOUR

#### Part I.

Pass back graded worksheets from day three (or pass back and have students peer grade.)

Engage students in a discussion to evaluate the meaning of average daily speed. Remember to focus on the length of time involved and how the average daily speed was not maintained every day (they did not travel on some days.) Thus if we decrease speed or distance on some days, what is the resulting effect on overall average speed?

## Part II.

Hand out colored pencils and a black-line master outline of North America for every student.

Use a projected or wall-mounted map of North America to look at the path of the Corps of Discovery. Revisit the [1803 map of the Northwest Territories](#) and the [1806 Lewis & Clark Map](#) and note the differences between those maps and a more modern map of the United States.

Have students mark the westward and eastward journeys using arrows and different colors.

Guide students to give the map a title, label basic map elements (Pacific Ocean, Washington, D.C., Columbia River, Rocky Mountains, Mississippi River, etc.)

Guide students to accurately show **all three** of the **three** elements listed below:

- Starting location
- Destination
- Route

Provide students with examples of journal excerpts to explore the challenge of physical obstacles that the expedition faced, such as those of rivers or mountains. Split the class into four or five different groups. Give each group a different excerpt from the Corps of Discovery expedition and ask students to read it, paying particular attention to the geographic challenges involved in the journey.

The Corps of Discovery  
Journal Excerpts

The Vote: Station Camp,  
Washington excerpt

Reconvene as a class and discuss these challenges. Rivers, mountains, snow, and unfamiliar land conditions are appropriate responses as are other obstacles mentioned in the journal excerpts.

Near the end of class, regroup and spot check student performance. Have students staple worksheet and map together. Collect and assess using rubrics provided.

Technology notes: Computer/LCD projector/Activeboard (Smart Board) could be used for students to trace over map of North America. Pre-installed maps could be used, as well as images from the internet.

## OPTIONAL EXTENDED ACTIVITY

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Ask students to compare their walking speed and the travel speed of Lewis and Clark with the travel speed of a commercial jet. Have them use a flight planner online (such as Travelocity or that of a specific airline) to calculate the speed of a transcontinental flight that changes in St. Louis and ends in Portland, Oregon. This can serve as a platform for discussing technological change and the impact on our perception of geographic scale.



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## FROM THE JOURNAL OF JOSEPH WHITEHOUSE

SEPTEMBER 16, 1805

When we awoke this morning to our great Surprize we were covered with Snow, which had fallen about 2 Inches the latter part of last night, & [it] continues a verry cold Snow Storm. Capt. Clark Shot at a deer but did not kill it. We mended up our mockasons. Some of the men without Socks, wrapped rags on their feet, and loaded up our horses and Set out without anything to eat, and proceeded on. Could hardly See the old trail for the Snow.



The painting, *The Constant Search for Food*, by Roger Cooke shows two corpsmen hunting. Washington State Historical Society Collection.

## FROM THE JOURNAL OF JOHN ORDWAY

SEPTEMBER 18, 1805

Some places [are] so steep and rocky that some of our horses fell backwards and rolled 20 or 30 feet among the rocks, but did not kill them...

eyes could extend. They extend much further than we expected.

We came to the highest part of the mountain, we halted... The Mountains continue as far as our

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## FROM THE JOURNAL OF MERIWETHER LEWIS

APRIL 25, 1806

**W**e traded for two horses with nearly the same articles we had offered at the village; these nags Capt. C. and myself intend riding ourselves; having now a sufficiency to transport with ease all our baggage and the packs of the men...



The painting, *Gift of the White Horse*, by Roger Cooke shows Lewis and Clark receiving a white horse from two Indian men. The corpsmen are holding out objects in return.

Washington State Historical Society Collection.

## FROM THE JOURNAL OF WILLIAM CLARK

APRIL 25, 1806

**I** was in the rear and had not proceeded very far before one of the horses which we had hired of the Chopunnish, was taken from Hall who I had directed to ride, he had fallen behind out of my sight at the time...



Roger Cooke's *Three Forks Trail* displays three corpsmen riding through rolling hills on horseback.

Washington State Historical Society Collection.

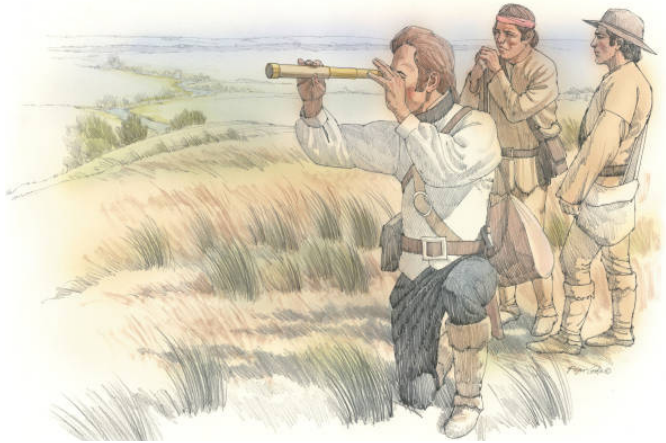
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## FROM THE JOURNAL OF WILLIAM CLARK

JANUARY 7, 1806

**A**fter walking for 2½ miles on the Stones my guide made a Sudin halt, pointed to the top of the mountain and uttered the word *Pe Shack* which means bad, and made Signs that we could not proceed any further on the rocks, but must pass over that mountain, I hesitated a moment & view this emence mountain the top of which was obscured in the clouds, and the assent appeared to be almost perpendicular; as the Small Indian parth along which they had brought emence loads but a few hours before, led up this mountain and appeared to assend in a Sideling direction, I thought more than probable that the assent might be torerably easy and therefore proceeded on, I soon found that the [blank] become much worst as I assended, and at one place we were obliged to Support and draw our Selves up by the bushes & roots for near 100 feet, and after about 2 hours labour and fatigue we reached the top of this high mountain, from the top of which I looked down with estonishment to behold the hight which we had



The painting, *Saw A Mountain*, by Roger Cooke depicts William Clark looking at a mountain in the distance.

Washington State Historical Society Collection.

assended, which appeared to be 10 or 12 hundred feet up a mountain which appeared to be almost perpendicular...



# LEWIS & CLARK IN COLUMBIA RIVER COUNTRY



## FROM THE JOURNAL OF MERIWETHER LEWIS:

APRIL 24, 1806

The road was rocky and sandy alternately, the road difficult and fatiguing... most of the party complain of the soariness of their feet and legs this evening; it is no doubt caused by walking over the rough stones and deep sands after being for some months passed been accustomed to a soft soil. My left ankle gives me much pain. I baided my feet in cold water from which I experienced considerable relief.



The painting, *blows Continuarly*, by Roger Cooke shows two corpsmen looking over the Columbia River. Washington State Historical Society Collection.



The painting, *Exploring McKenzie Head*, by Roger Cooke portrays William Clark leading a group of corpsmen out onto McKenzie Head. Washington State Historical Society Collection.

## FROM THE JOURNAL OF PATRICK GASS:

APRIL 25, 1806

The men in general complain of their feet being sore; and the officers have to go on foot to permit some of them to ride.

# LEWIS & CLARK IN COLUMBIA RIVER COUNTRY



Portion of 1803 map of northwestern territories, untitled, by Nicholas King. Library of Congress Geography and Map Division, Washington, D.C.



# LEWIS & CLARK IN COLUMBIA RIVER COUNTRY



Portion of the 1806 map by Meriwether Lewis and William Clark, titled "Map of part of the continent of North America: whereon is laid down the Missouri... and the Columbia Rivers, from the Mississippi to the Pacific Ocean." Courtesy of Boston Athenæum.

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## THE LEWIS & CLARK CANOES ON THE COLUMBIA RIVER



Barbara Danielson photo

# *Sold Our Canoes* FOR A *Few Strands* OF *Beads*

**B**IRCH BARK CANOES constructed by northeastern Indian tribes revolutionized travel for 17th-century European explorers and entrepreneurs who ventured into the dense forests at the heart of the continent in search of mythical geographic passages and riches in furs. Early French explorers such as Samuel de Champlain quickly seized upon the importance of the Indian design that allowed light, maneuverable canoes to be paddled facing forward versus the early European attempts to row, facing backward, in heavy longboats on rapidly flowing

*ABOVE: This replica dugout canoe on display at Fort Clatsop approximates the size and form of the canoes Lewis and Clark constructed at Canoe Camp on the Clearwater River in 1805.*



BY ROBERT & BARBARA DANIELSON

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North American rivers. Utilization of the birch bark canoe was a singular factor that enabled Europeans to penetrate the vast northern continental interior. However, across the Great Plains in the West another solution to water travel was necessary as no tree produced bark that would sheath wood-frame canoes. (Exceptions to this were the small, flatwater cedar frame and Western white pine bark canoes—the so-called sturgeon-nosed canoes—used by some bands of the Kalispel, Kutenai, and Salish Indians.)

The answer to the problem was dugout canoes constructed entirely from single logs. This construction form reached its supreme level on the West Coast where Indians, freed from a migratory hunting and gathering economy primarily by a sedentary salmon economy (the resource came to them), were able to allocate time and human resources to the development of religion, arts, and the building of elegant, thin-walled, and ornamental canoes. Inland, however, the less stable economies required canoe building but in a more rude and practical form. It was this latter form of canoe building that the Lewis and Clark expedition adopted as they penetrated the last miles of what would become the American West.

CANOES WERE OBVIOUSLY essential for transporting expedition members, baggage, trade goods, guns, powder, lead, and scientific instruments on the waters of the Columbia River in order to reach their ultimate objective—the Pacific Ocean. But the canoes' importance in hunting and relations with the Indians as well as their role in strategic designs to return home may be less appreciated. Canoes were much more than wooden flotation devices. The way canoes were utilized on the Columbia River demonstrates once again that the two major elements contributing to the overall

success of the expedition were thorough advance planning and the ability to adapt when things did not go as planned. The Moulton edition of the journals of Lewis, Clark, Ordway, Gass, and Whitehouse is used here to make a definitive canoe inventory and to elucidate trade details for canoes, the handling of canoes at portages, and the fate of the expedition's canoes.

On October 7, 1805, the expedition—33 in number plus two Nez Perce chiefs, Shoshone guide Toby and his son, and Lewis's dog Seaman—resumed their journey by water from Canoe Camp near present-day Orofino, Idaho. For the first time, gravity and currents were in their favor as they traveled down the Clearwater River with about two tons of baggage in four large canoes and a “small pilot canoe.” The size of the dugout canoes is never explicitly stated in the journals. The large canoes were probably 35 to 40 feet in length and the small canoe about 25 to 30 feet long. The canoes were constructed from ponderosa pine logs felled next to the river and laboriously formed by burning out the central cavities and shaping them with small hand tools. A clue to the mass of the large canoes may be found in the journal of Reverend Samuel Parker who followed Lewis and Clark down the Columbia River 30 years later. Scouting for mission sites in June 1836, he descended the Columbia in a large Indian canoe obtained at Fort Walla Walla and stated that 20 men were needed to carry it “on their heads and shoulders” around the rapids at “La Dalles.” The dugouts used by Lewis and Clark may have been of similar size or perhaps even heavier.

Despite extremely rough water, rapids, falls, rocks on the rivers, severe winter storms in the Columbia River estuary, and numerous repairs, all of these ponderosa pine dugout canoes served the expedition well with no catastrophic failures. They were abandoned only when much lighter, more agile, Indian canoes



*Edward Curtis photo, taken at the Long Narrows c. 1910, of a Wishram canoe that resembles the canoe Lewis acquired below Celilo Falls. As the stern cannot be seen, it could be either a Cutwater or Chinook form.*



Edward Curtis Collection, Special Collections, Washington State Historical Society

became available, accidental losses occurred, or horses became the preferred mode of travel on the 1806 return journey.

It was a rough ride down the Clearwater and Snake rivers. By Captain William Clark's account they passed 39 rapids, 15 of which they labeled as "bad" on the Clearwater River; and 34 rapids, of which 9 were "bad," on the Snake River—a distance just short of 200 miles. The canoes took a battering over several of the worst rapids, but only on October 15, as they neared the confluence of the Snake and Columbia, was it necessary to portage some of the baggage. Nonetheless, the peril to the party and their canoes on the Columbia River tributaries was real and recognized. Clark wrote on October 13: "We should make more portages if the Season was not So far advanced and time precious with us." The Pacific Ocean was still far distant, but they felt they must reach their ultimate objective before winter. That meant taking risks and endangering their only mode of transportation as they passed through the treeless Columbia Plain.

**T**HE MID-COLUMBIA presented smoother sailing for the expedition, and for the next 122 miles after leaving the confluence they encountered only 12 rapids worth noting; 7 of them "bad," including the notorious "muscle shell" rapids (later known as the Umattilla Rapids). The day they passed this rapid, Private Joseph Whitehouse reported: "We found the day pleasant and the Navigation of the River easy, excepting at the Rapids several of which we passed... without any accident happening." But difficult passages lay ahead.

The first of the two major barriers to river travel between Canoe Camp and the lower Columbia was reached on October 22. All the baggage was unloaded and carried around the Great Falls of the Columbia (Celilo Falls, now submerged) on the north side and the empty canoes taken down the south side of the river the following day. Neither here nor at any other time is there any indication that any of the ponderosa pine canoes were actually lifted and carried—the wet weight of these vessels was simply too great. Sergeant Patrick Gass states: "We had to drag them 450 yards round the first pitch which is 20 feet perpendicular." They were then lined down the remainder of the narrow channel (temporarily losing one canoe) and paddled over to the camp on the river's north side. It was there, just below the present railroad bridge near the modern town of Wishram, that the first change was made in the little flotilla.

Captain Clark wrote in his first draft of October 23: "Exchanged our Small canoe for a large & a very new one built for riding the waves." He described it as "butifull of different Shape & Size to what we had seen above wide in the middle and tapering to each end... curious figures were cut in the wood." Clark added that the man who sold him the craft had himself "purchased it of a white man below for a horse... neeter made than any I have ever Seen and Calculated to ride the waves, and carry emence burdens, they are dug thin and are supported by cross pieces of about 1 inch diamuter..."

## LEWIS & CLARK and the End of the World



A play by Bryan Willis

**THURSDAY, MAY 5, 7 PM**

*Free program and free museum admission 5-8 PM*

The Washington State History Museum is pleased to present *Lewis & Clark and the End of the World* by Washington playwright Bryan Willis.

Just three years after his famous expedition across an uncharted continent, Meriwether Lewis, American hero, met an ignoble end. He spent his final night in a state of dejection and delirium, calling out for his old friend William Clark in a two-room "hotel."

In this play, his friend appears, and together they relive a panorama of experiences—the flash of a life before the eyes. What emerges is a portrait of two imperfect men whose powerful personal bond allowed for a fleeting greatness. Funny, heartwarming, and tragic, *Lewis & Clark and the End of the World* is a reflection on one of the most controversial events in early United States history; a tribute to the strength—and a reminder of the frailty—of the human spirit.

It was obviously a finely crafted canoe, far superior to their small pilot canoe. It seems strange that the owner, in an area where the Indians later often proved less than friendly, would part with it for a heavy, rudely made dugout canoe, a hatchet, and a few trinkets. The trades made for the expedition's Indian canoes on the return journey were perhaps even more one-sided, but this time in favor of the native traders.

Once again, nothing is specifically recorded about the dimensions of the Indian canoe and, despite being referred to as "large" by Clark on October 23, all future references to this canoe categorized it as a "small" one. Following is a more complete description of this canoe given by Captain Meriwether Lewis while the party was encamped at Fort Clatsop.

The Indian canoe was temporarily lost at Fort Clatsop on January 11, 1806, and Lewis wrote: "This will be a very considerable loss to us if we do not recover her; she is so light that four men can carry her on their shoulders a mile or more without resting; and will carry three men and from 12 to 15 hundred lbs."

At Fort Clatsop on February 1, Lewis described the four “forms” of canoes used by the Indians below the “grand chatarac” (Celilo Falls), and he used much the same words to describe the third and most common form: “[It] is usually 30-35 feet long, and will carry from two to twelve persons. 4 men are competent to carry them...say a mile without resting.” Clearly, this third form of canoe represents the canoe purchased at Celilo Falls. James Ronda identifies the form of this canoe in modern terms as a cutwater canoe. It differs from the oft-illustrated Chinook style, which has a vertical stern as compared to the gradually ascending stern of the cutwater Clark described on October 23, 1805.

Whether it was 30 to 35 feet long is debatable due to later characterizations, repeated and consistent, of its being “small.” Regardless, this canoe (probably constructed of western red cedar) would prove to be the canoe of choice in the following months for small hunting parties and rough water situations. Meriwether Lewis had made an excellent trade at Celilo Falls.

**T**HE EXPEDITION CONTINUED downstream from the falls on October 24, running the Short Narrows of The Dalles in the five loaded canoes—the non-swimmers walking with the valuables—and continuing on to the “Great Mart” (the center of trade in the Pacific Northwest) at the head of the Long Narrows. It was necessary to make a partial portage of a mile on the 25th, some carrying the valuables by the worst of the Long Narrows and others standing on shore with ropes in case of capsizing; but the dangerous narrows were navigated safely. The corps camped at Rock Fort (located now in the city, The Dalles) where trees once again appeared on the hillsides. Here they collected pine pitch to repair the canoes, dried the baggage, and hunted before proceeding down the gorge. The expedition resumed the voyage on October 28 and arrived at the Columbia River’s second great barrier to water travel—near the western end gorge—on October 30.

The Upper Cascades of the “Great Shute” (just down river of present-day Stevenson, Washington) was perhaps the most formidable barrier on the Columbia River and required that the canoes be unloaded and the baggage carried (the Indians also carried their canoes) at least half a mile. Joseph Whitehouse wrote on the 31st that they “took down two [large] canoes 1 at a time over high rocks on rollers, by main [man] strength and by being in the water which ran between Sd. [Starboard] Stone & large rocks.” On the following day Whitehouse reports that they carried all the baggage and took down “the other two large canoes, and th[e] Small [Indian] one.” According to Clark, the Indian canoe was carried around the “Great Shute” on November 1: “We set about taking our Small Canoe and all the baggage by land 940 yards of bad Slippery and rocky way.” They could carry the Indian canoe but struggled mightily with the others, using “rollers” or, as Clark described it, “we got the 4 large canoes over by slipping them over rocks on poles placed across from one rock to another, and at some places along partial streams

of river.” On November 2 they portaged the Lower Cascades (at the downstream end of “Brant Island,” present-day Bradford Island, at Bonneville Dam), and took the partially loaded canoes down one at a time—they were now past the last rapids and on tidewater. Unknown to the expedition, tidewater meant that they had only to descend about 9 vertical feet to the Pacific Ocean—9 feet left out of 7,373 feet at Lemhi Pass, where they had crossed the Continental Divide.

The men and canoes had taken another battering at the Cascades, but even more difficult times lay ahead at their ultimate westerly destination. It took six days to reach the broad estuary of the Columbia over relatively placid water. There they spent the next 18 days on the north side of the river in what is now the state of Washington, enduring terrible winter storms that inflicted severe blows to the ponderosa pine canoes. However, the two-month river voyage had not prepared the expedition with their four clunky dugouts and one Indian canoe for the “great fury” and “emence waves” of the Columbia estuary. The day after the first sighting of the “ocian” (November 7) at Pillar Rock, the “swells were so high and the canoes roled in such a manner as to cause several to be very sick.” The dugouts were not designed for the swells and waves encountered at the mouth of the Columbia River, and caution would be exercised as they made their way through waters the like of which no expedition member had ever experienced.

After cautiously coasting the perimeter of Grays Bay on the 8th, they found “the swells or waves so high that we thought it imprudent to proceed,” and they landed on the east side of Grays Point about 20 miles short of river’s mouth, remaining there until November 10. Once ashore their chief concern was for the canoes, but even so one sunk and three others filled with water as they lay pinned down on the open beach between masses of driftwood shifting in high tidewater and steep, densely vegetated hills. Clark wrote that the

*flood tide came in accompanied with emence waves and heavey winds, floated the trees and Drift which was on the point on which we camped and tossed them about in Such a manner as to endanger the Canoes verry much, with every exertion and the strictest attention by every individual of the party was scarcely sufficient to Save our Canoes from being crushed by those monterous trees maney of them nearly 200 feet long and from 4 to 7 feet through.*

One might expect the expedition’s enthusiasm for reaching the Pacific Ocean to be rapidly waning, but Clark goes on to say that the party “are cheerful and anxious to See further into the Ocian.” They hadn’t come over 4,000 miles to stop short now.

When the weather improved somewhat the next day, November 10, the expedition managed to inch toward the ocean along the shore for about nine miles until they were stopped short of present Point Ellice, which they graphically named Point Distress. Here they were again pinned down on another totally inhospitable piece of rugged shore. Their sole



Lewis and Clark Journals, Codex H, American Philosophical Society



ABOVE: The Great Falls of the Columbia, later called Celilo Falls, drawn by Clark October 1805. The baggage portage is shown by the dotted line on the left and the canoe portage in the upper right hand corner.

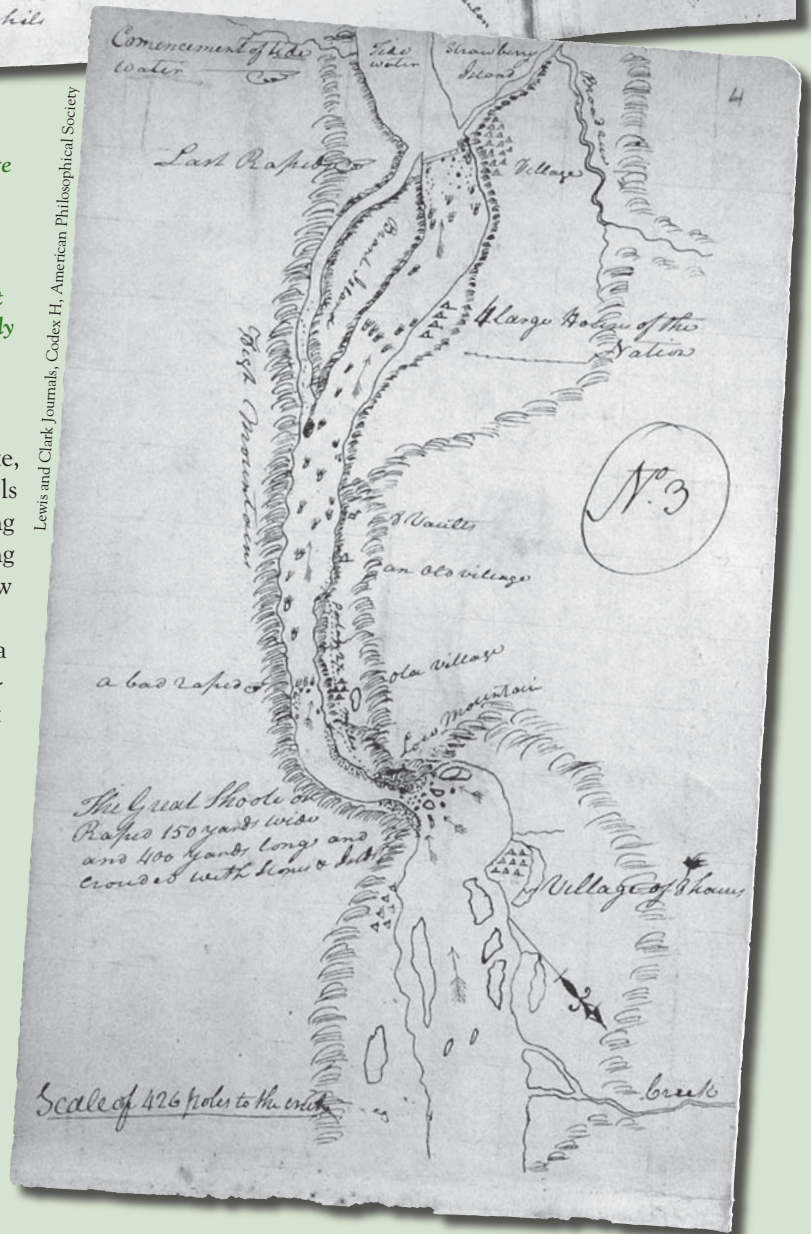
RIGHT: The 1805 portage of the Upper Cascades is shown by the dotted line from the "Great Shoote" to just above "a bad rapid." The 1806 portage from the big eddy is marked "Portage 2 1/2 miles."

tactical objective became to reach a decent campsite, and that was only possible by canoe. Their vessels and skills, however, were not up to the task of taking on the violent waters of the estuary in the prevailing weather, but the local Indians soon showed them how it could be done.

At noon on the 11th, "5 Indians came down in a canoe, the wind very high from the S.W. with most tremendous waves brakeing with great violence against the Shores, rain falling in torrents...our canoes... at the mercy of the waves..." The Cathlamets were merely selling fish, not performing an act of bravado. Clark had only praise for them, "...certainly the best Canoe navigaters I ever saw."

**B**reakout from their terrible location became imperative. The next day three men attempted to round Point Ellice in the cutwater Indian canoe, which Clark described as being very similar to the canoe that had brought the five traders from across the estuary to their camp the day before. The attempt failed. Later that day they had to load and sink the canoes with rocks to "prevent their dashing to

Lewis and Clark Journals, Codex H, American Philosophical Society





pieces against the rocks....” The following day, November 13, Privates John Colter, Alexander Willard, and George Shannon were dispatched in the Indian canoe; they successfully rounded the point and located a good campsite a short distance downstream at what came to be called Station Camp, near present-day McGowan.

Now it was the dugouts’ turn. One of the dugouts was “much broken by the waves dashing it against the rocks” on November 14 but was successfully repaired. On the same day Lewis, hunter George Drouillard, and Privates Joseph Field, Reubin Field, and Robert Frazer set out in another dugout to round Point Ellice with five additional men who would return with the dugout while Lewis and his party struck out by land to determine if “any white men were below within our reach.” Lewis hoped—in vain, as it turned out—that they might find sea traders who could aid their cause. When they reached the Pacific they would reconnoiter the north side of the Columbia and the coast above it.

The dugout returned safely albeit half full of water. The next day, November 15, Clark attempted to pass Point Ellice in an unloaded dugout but was driven back by the violent waves. Undaunted, at mid afternoon the “wind lulled” and Clark had the dugouts “loaded in great haste and Set out, from this dismal nitich... proceeded on passed the blustering point below which I found a butifull sand beech.”

The main party remained at Station Camp, just east of present-day Chinook Point, until November 24. Lewis’s party returned from the vicinity of Cape Disappointment on November 17, and Clark took a party of 10 to the coast the following day to see more of the ocean. Both parties went by land, borrowing Indian canoes to cross the rivers feeding into Baker Bay.

**F**OLLOWING CLARK’S reconnaissance of the coast from Cape Disappointment to the vicinity of the modern town of Long Beach, he wrote in his journal on November 20 “...I employed Those Indians to take up [to Station Camp] one of our canoes which had been left by the first party that Came down...” It is evident that first party had stashed the cutwater canoe and left it unguarded for six days. Meanwhile, Indians had stolen Colter’s gig and basket on the 13th and the next night “stold both his [Shannon’s] and Willard’s guns from under their heads” while they slept. (All items were recovered.) Shannon told Clark the Indians below were “rogues” and clearly did not trust them, but nonetheless he had left their most valuable canoe unattended for six days. It seems likely that they had carried it beyond the reach of the eight-foot tides and hidden it; both Colter and Shannon were in Clark’s reconnaissance party and must have led Clark to its hiding place. Regardless, it was a risky move to leave the canoe unattended after the locals had demonstrated a proclivity for stealing, and it seems odd that the captains did not dispatch men to retrieve the canoe at an earlier date.

During their stay at Station Camp the decision was made to proceed to the south side of the Columbia River in search

of winter quarters. This move was based on the prospects for salt-making, an abundance of game, milder weather (compared to that upriver), and the possibility of a visit by a trading ship. Thus, on November 25 the expedition loaded the five canoes and proceeded upriver as the three-to-five-mile-wide estuary was too dangerous to navigate directly, although the Clatsops readily crossed “through emence high waves.” The corps encamped near Pillar Rock once again, crossed without incident where the river narrowed, and then descended the island-cluttered south shore to set up a base camp on Tongue Point (named Point William by Clark) on the 27th. During their landing, one of the pine dugouts “was split to [two] feet,” the last damage the canoes incurred on the Columbia prior to winter encampment.

On November 29 “Lewis and 5 men Set out in our Small Indian canoe” to hunt elk and locate a winter camp, “the swells and waves being too high for us to proceed down in our large Canoes, in Safty.” Elk were found to be abundant, and an appropriate camp site was found on the present-day Lewis and Clark River. By the end of 1805 Fort Clatsop was completed and the nearly three-month wait began, after which the weather would permit their return upriver. Now it was time for survival, trading, re-outfitting, journal writing, natural history observations, map making, strategic planning, and waiting in what seemed like eternal rain.

The canoes played an absolutely essential role in hunting and putting food on the table. During their time at Fort Clatsop several major changes occurred in the fleet. Sergeant Patrick Gass estimated that 131 elk were taken during the corps’ residence at Fort Clatsop, and probably most of the butchered animals, by far their main food and leather source, were retrieved and transported to the fort by water. Canoes were also used to move men partway to the salt-making camp on the Pacific Ocean and to travel upriver to trade for sturgeon, anchovies and wapato. The constantly wet, dense coastal rainforest made travel by land difficult at best, and whenever possible the men traveled by canoe.

Not all went well with the expedition’s canoes at Fort Clatsop, despite the apparent ease with which the Indians handled and maintained their large number of fine canoes in the face of powerful Pacific storms and tides. On January 11 the “Indian Canoe” was taken out by the tide and given up as lost on January 12. Lewis “lamented” the loss of this most valuable asset. However, it was recovered on February 5 with a whoop and celebratory gunfire from hunter Reubin Field. Another canoe, “one of the large perogues,” was temporarily lost for three hours when the tide broke the cord and carried it away. Lewis wrote that “had we lost this perogue also we should have obliged to make three small ones, which... would be a serious undertaking.” Here and on November 29 Lewis reintroduces the term “perogue,” applying it to watercraft very unlike those they had used on the Missouri River. The January 14 entry by Lewis also explicitly establishes that they had a total of four “perogues,” confirming that none of the large pine

dugouts had been lost or damaged beyond repair prior to their arrival at Fort Clatsop.

The meaning of the word “perogue” (actually pirogue—Lewis’s spelling is retained here) has been much debated. Clearly, the meaning varied among expedition members and changed with time. On the Columbia only Lewis used the term. Clark referred to all vessels as canoes, even when copying Lewis’s entries at Fort Clatsop in which Lewis used “perogue.” Although Lewis sometimes collectively referred to all vessels as canoes, at other times he referred to the large pine dugouts as perogues and all Indian watercraft as canoes. The other journal writers differentiated as to size by using the adjectives “large” and “small” (or “light”) for the canoes. Thus, almost all references on the Columbia River to either a large canoe or perogue refer to the dugouts constructed on the Clearwater River.

Following a detailed February 1 description of the four types of Indian canoes used on the Columbia River, Lewis stated that “they [Indians] prize their canoes very highly; we have been anxious to obtain some of them, for our journey up the river but have not been able to obtain one as yet from the natives in this neighborhood.” Acquiring “some” Indian canoes developed into part of the overall return travel strategy as Lewis expressed it on April 2 at present-day Washougal:

*... to exchange our perogues for canoes with the natives on our way to the great falls of the Columbia or purchase such canoes from them for Elkskins and Merchandize as would answer our purposes. These canoes we intend exchanging with the natives of the plains [Columbia Plateau tribes] for horses... as will enable us to travel altogether by land.*

CANOES HAD BECOME more than just a means of travel—they were also thought of as a way to facilitate the transition to land travel to reach the Nez Perce, who were looking after the expedition’s horse herd, in time to cross the Rocky Mountains by early June and reach St. Louis in 1806.

Canoe problems continued at Fort Clatsop when two perogues were damaged by the tide on March 3. A more serious problem arose on March 11 when a perogue sank and was lost in the Netul River (now called the Lewis and Clark River). Searches were made for the perogue on March 11, 12, and 13, but it was given up as lost and never recovered. Also on March 11 Sergeant Nathaniel Pryor briefly lost their cutwater Indian canoe when it drifted away while he was trading upriver with the “Cathlahmahs” (Cathlamets). He borrowed a canoe from the Indians to return to Fort Clatsop; on his return he found the errant canoe and secured it for later retrieval. George Drouillard, one of the ablest men of the party, recovered it on March 17.

The possible loss of two canoes on March 11 as well as the approach of April 1, the proposed departure date, may have precipitated the active pursuit of additional Indian canoes. On March 13 Drouillard was sent to “the Clatsop village to purchase a couple of their canoes if possible.” The Clatsops,

*The Columbia River below Celilo Falls where a railroad bridge pier now rests on the small island in the center of the channel. The 1805 baggage portage ended at the far right, near the base of the hill; the canoe portage is upstream, not visible in the photo.*



however, proved to be tough traders. Drouillard returned the next day with the Clatsops who brought “an indifferent canoe,” which they refused to trade for Lewis’s “laced uniform coat”—the expedition’s best trade item (besides guns). A second Clatsop canoe was brought for trade on March 15, but once again no deal could be struck, even for the artilleryist’s coat. Private Joseph Whitehouse wrote that Drouillard was dispatched on the same day to the Cathlamet village to purchase a canoe.

On Monday, March 17, Drouillard returned not only with the Celilo Falls cutwater Indian canoe that Pryor had stashed, but also with a “Cathlahmah” canoe acquired in trade for Lewis’s uniform coat and half a carrot (a spindle-shaped bundle of rolled and twisted tobacco). Now they had sold off one of their most valuable items; Lewis realized that for the Indians “a canoe... is an article of the greatest value except a wife... we yet want another canoe...” Clark continued, “As the Clatsops will not sell us one, a proposition has been made by one of our interpt [interpreters] and sever[al] of the party to take one in lieu of 6 elk which they stole from us this winter.”

The meat of six elk shot by Drouillard had been taken on February 6 by Clatsops who than brought back three dogs as “renumeration” on February 12; but the dogs ran off. On February 22 Drouillard went to the Clatsop village “to get the dogs which the Clatsops have agreed to give us in payment for the Elk they stole...” and returned on February 24 with two dogs. This was not quite the end of it, for on March 18 Whitehouse writes, “Our officers sent 4 men... in order to get a small Canoe which belonged to the Clatsop Indians. They returned in the Evening with the Canoe.” This canoe was the one used by Reubin and Joseph Field and Drouillard when the expedition ascended the Columbia River. Indeed, it may be that Drouillard was the “interpt” who suggested, according to Clark, that they steal the canoe. In any event, they had already received two dogs for the elk, and on March 24, when confronted by the canoe’s “Cathlahmah” owner on the Columbia River, they paid him an elk skin for it. In their haste to return upriver they were in no mood to argue the fine points of a questionable acquisition.

**O**N MARCH 22 Drouillard and the Fields brothers left Fort Clatsop in a small Indian canoe as an advance hunting party to a camp beyond Point William (Tongue Point). The homeward voyage had begun. The next day Sergeant Gass wrote, “We were employed... in dividing and packing up our loading; and distributing it among the canoes, which were five in number, three large and two small... at 1 o’clock, left fort Clatsop.” Thus the canoe inventory on March 23 at the beginning of “our homeward bound journey” was three small Indian canoes and three large pine dugouts, or “perogues.” From the Columbia River estuary to the Long Narrows of The Dalles the perogues served as freight and passenger vessels while the light, maneuverable Indian-made canoes carried parties of two to four for hunting, gathering pitch, and short recon-



#S1991.51.452, Special Collections, Washington State Historical Society

naissances. The exception to this pattern was when Clark and eight men explored six miles up the Multnomah (now Willamette) River in a single dugout.

Once on the Columbia River, Lewis and Clark were initially satisfied that they had enough canoes—they were offered one for sale on March 23 by a party of Chinooks, but the captains declined, “being already supplied...” However, on April 1 they had a change of heart and tried to purchase a canoe for six fathoms (36 feet) of white wampum beads, but the deal was quickly cancelled by the Indian seller. Maybe this was just too good a deal for Lewis to refuse, or perhaps it represented a change in strategy as expressed the following day at present-day Washougal (Provision Camp). Thinking ahead to when they would retrieve their horses from the Nez Perce, Lewis wrote of their plan to exchange dugouts for canoes and canoes for horses so that they could travel by land. “A large stock of horses” would be necessary to transport their baggage over the mountains and would also serve as a “certain resource for food.” The hungry westward passage over the Bitterroots had not been forgotten.

It appears likely that the strategic plan to acquire horses at the earliest opportunity had already been decided upon at Fort Clatsop. (No horses were found by the expedition or later explorers below the White Salmon River, 170 miles upriver from the mouth of the Columbia.) The descent of the Columbia and Snake rivers by canoe in the fall of 1805 had been an expeditious, if risky, way to travel. But ascending the same waters in the spring freshet was an entirely different proposition. Clark would no doubt have been reminded





*Wanapum canoe near Priest Rapids, 1951 (Wanapum boy is Willy Buck). The mid-Columbia Indian dugout canoes lacked the elegant bow and stern features of the lower Columbia canoes and resembled the expedition's Clearwater canoes.*



of the 80 or more rapids they had passed as he prepared his maps at Fort Clatsop.

**A**PRIL 9 FOUND the expedition at the foot of the Lower Cascades, with Drouillard and the Field brothers on the north side of the river in the “smallest canoe” (the stolen one) and the rest of the party camped on the south side with the other five vessels. The next morning the dugouts were taken across the south channel to Brant (Bradford) Island, towed upstream a quarter mile past the lower rapids and paddled to the north shore. Sergeant Pryor and Private John Collins followed in the two Indian canoes after collecting “rosin” for “paying” the canoes. All the loaded canoes were then towed up to the end of the portage (a distance of about two miles) one at a time.

Drouillard’s canoe went first. Once unloaded, according to Gass, it suffered a broken elk “chord” and was swept downstream below the Lower Cascades. There it was caught and returned to the portage by Indians who were rewarded with two knives. The corps lined the other canoes “to the lower end of the portage of the big Shoote and unloaded in the large eddy... and carried all the baggage on the top of the hill, and Camped.” The “large eddy” is at the site of historic Fort Rains and the steamboat “Middle Landing” and about two miles above the November 1, 1805, camp. The beginning of this long portage was well downstream of the 1805 portage of 940 yards. The 1806 portage was variously estimated at 2,800 yards, one and a half or two and a half miles.

The whole next day, April 11, was spent taking the three Indian canoes and two of the perogues from the beginning of the portage to the island campsite of October 30 and 31, 1805, and the April 12, 1806, camp above the “big Shoote” (Upper Cascades). The river was in partial flood stage, “up to 20 feet higher” than when they had descended in the fall. This made the portage long and required them to line the perogues and two of the Indian canoes for the entire five mile distance. Drouillard’s small Indian canoe was carried along the portage trail and the others were lined up with “great toil and danger” by 22 men, with additional help from the local Indians, for a distance of three miles.

Ordway described how the second dugout was brought up: “This large canoe filled twice with water at the worst pitch but with some difficulty and hard fatigue got them Safe up towards evening by the assistance of a number of Indians at the worst pitch & C. and halled the large canoe up by force although She was full of water.” The men were too “much fatiequed” to bring up the third perogue; nonetheless Drouillard and the Field brothers were sent ahead to “Crusatte’s river” (now called Wind River) to hunt and await the rest of the party. It had been a tough day.

In the rain the next morning Lewis and “every man that could be of any service” attempted to take the third perogue above the Cascades from the large eddy:

*In hawling the perogue around this point the bow unfortunately took the current at too great a distance from the rock, she turned her side to the stream and the utmost exertions of all the*



*Edward Curtis photographed this Indian canoe a few miles above the Cascades of the Columbia (c. 1910) where Lewis traded for two canoes to replace the loss of a Clearwater perogue in April 1806.*

*party were unable to resist the force with which she was driven by the current, they were compelled to let loose the cord and of course both perogue and cord went a drift with the stream.*

No attempt was made to recover the craft. Lewis looked ahead and figured that the loss would “compel us to purchase one or more canoes of the Indians at an extravagant price.” Putting the loss of a second Clearwater dugout behind them, they set out to carry the baggage over the portage. About 22 men (“all hands”) each carried four loads of baggage, which may have totaled between 3,000 and 4,000 pounds. This they distributed in the four available canoes (Drouillard was upriver hunting) on April 13 and set out, but they quickly realized that the heavy loads rendered the “vessels extremely inconvenient to manage and in short rather unsafe...” As he had done so often in the past, Lewis calmly understated a precarious situation.

Lewis set about resolving the canoe shortage by crossing the river to an Indian village in the vicinity of present-day Cascade Locks. He traded two robes and four elk skins (Ordway says two pieces of blue cloth and two elk skins) for two canoes. In addition, he acquired four paddles and three dogs for some deerskins. The price was much lower than the Chinooks and Clatsops had demanded at the mouth of the Columbia. Now fully outfitted with five Indian canoes and two perogues, the corps headed upriver toward the next barrier to river travel with Ordway in charge of the two new canoes (it was his perogue that had been lost).

**A**RRIVING AT ROCK FORT on April 15, Lewis and Clark began to fulfill their overall travel strategy to acquire horses so they could travel by land. At eight o'clock the next morning Clark crossed the river to the area known as Rockport and commenced trade negotiations for horses. However, the Indians were not to be rushed into any trades for horses. After his unsuccessful bartering attempt at Rockport, Clark moved up to the head of the Long Narrows—the “Great Mart” and the main Wishram-Wasco village. On November 17 Clark set out his “merchandise” on a rock and was open for business. The dealing was tough; the prices were high. However, by the end of the day the party



Edward Curtis Collection, Special Collections, Washington State Historical Society

had acquired four horses, and Clark had notified Lewis back at Rock Fort of the local Indians' great reluctance to trade for horses. Sending word to Clark to double the price offered for horses, Lewis reckoned they would need 12 horses to carry all the baggage, and he set his men to making 12 pack saddles. Lewis was still confident that they could trade Indian canoes for horses once they reached the “Mussel shell rapid where horses are more abundant and cheaper.”

On April 18 Lewis set out up the river to the Threemile Rapids (as named by latter-day steamboaters and located below The Dalles Dam) where they unloaded the canoes and dugouts, made a portage of 70 paces, lined the vessels up the rapids, reloaded (one “canoe” was split and its baggage carried, according to Gass), and proceeded on to the Big Eddy (behind The Dalles Dam near present-day Spearfish Lake) to camp. The Long Narrows was in flood, and Lewis judged conditions too “formidable” to pass either “up or down them in any vessel.”

The next day they planned to portage the entire two-mile length of the Long Narrows, but they could not take the two “perogues” any farther—presumably because they were too heavy to carry and the water too wild to line them. So the dugouts became firewood, a commodity in short supply now that they had reentered the Great Columbia Plain. At this point the expedition was totally dependent on Indian canoes and horses for hauling their baggage and any personnel unfit to walk.

On April 19, with the aid of the four horses Clark had purchased, the baggage was transported past the still intact pictograph, "She Who Watches" (which they didn't notice), to the head of the Long Narrows. The five Indian canoes were taken out of the water, partially dried to lighten them, and carried to the Wishram village near present-day Horsethief Lake State Park (not to be confused with the railroad town of Wishram). They began the portage at three in the afternoon. It was no small matter to carry the five canoes. As Clark wrote, "All hands brought over the Canoes at 2 lodes which was accomplished by 5 P.M." This was the only time that all five of the Indian canoes were actually carried. During this day and the one following, the increasingly serious game of trading underwent a major change.

Lewis and Clark managed to acquire five additional horses on April 19, but at a high cost. They were forced to trade three kettles which left them only an absolute minimum number to cook with for the remainder of the voyage. Still short of horses, Clark led an advance party upriver from the head of the Long Narrows to the site of a Tenino village just below the Great Falls of the Columbia (Celilo Falls) to acquire more horses. By this time Lewis was becoming frustrated at the difficulty of the trading and severely "reprimanded" Alexander Willard when he lost one of the horses.

Lewis's patience wore even thinner the next day when it was discovered that the Indians had "pilfered six tomahawks and a knife" and he found that further attempts to trade for horses were futile. He had acquired only two "indifferent horses for which I gave an extravagant price." The canoes he had so counted on exchanging for horses proved to be nearly worthless. He decided to take the ten horses they had acquired and two canoes loaded with the baggage that the horses couldn't carry and proceed upstream to bargain with perhaps more cooperative Indians. As for the other three fine Indian Canoes: "I barted my elkskins old irons [perhaps his branding iron, etc.] and two canoes for beads." Beads! The third canoe "for which they would give us but little I had cut up for fuel." The next morning he ordered "all the spare poles, paddles and the balance of our canoe put on the fire as the morning was cold and also that not a particle should be left for the benefit of the Indians."

**W**HILE LEWIS WAS experiencing limited horse-trading success and near unlimited frustration with the Wishrams, Clark fared even worse with the Teninos, albeit under more civil circumstances. On the 20th he displayed all his wares, which included "a blue coat, Callico shirt, a handkerchief, 5 parcels of paint a Knife, a wampum moon, 4 braces of yellow beads...my large blue blanket, my Coat Sword & Plume." He went on: "I used every artifice decent & even false Statements to induce those pore devils to Sell me horses." But that day he got none.

The next morning he admitted defeat and just waited for the arrival of Lewis and the remainder of the party. At the

same time, after burning the last particle of the canoe, Lewis departed the Wishram village to join Clark below the Great Falls. The two remaining canoes were "loaded heavily" and Sergeant Gass and three men took them upriver from the head of the Long Narrows. With "some difficulty" they passed the Short Narrows and arrived at the Great Falls after a five-hour upstream struggle of six miles. Lewis and his men joined them, and the full party of the expedition, now reunited, portaged around the Great Falls, carrying the baggage and the two canoes. The expedition camped above the falls on the north shore after sending the two canoes on ahead to the vicinity of present-day Deschutes River—Patrick Gass and Reuben Field in one, John Colter and John Potts in the other. That two men could navigate each loaded canoe upstream indicates how light and maneuverable these Indian canoes were.

On April 22, still deficient in horses, the land party continued walking along the river's edge, making sure they came in contact with all the Indians possible in order to trade for horses, dogs, Shappelell (cous—a native tuberous root), and wood. The land and water parties were not united again until April 23 at the camp near present-day Rock Creek, the site of a large Tenino village. Here they had a pleasant evening, the first in a long time, with smoking, violin playing, and dancing. To add to the occasion, "the natives promised to barter their horses with us in the morning we...hope that we shall be enabled to proceed by land from hence with the whole of our party and baggage."

They arose early on April 24 in anticipation of a successful day of trading and the hope of being able to proceed unhindered to the Nez Perce villages and the mountain trail back to the United States. Having purchased three horses and hired three more (for a total of 22), they were able to cease their laborious canoe travel up the Columbia River. Lewis wrote, "The natives had tantalized us with an exchange of horses for our canoes...but when they found we had made our arrangements to travel by land they would give us nothing for them... Drewyer struck one of the canoes and split off a small piece with his tomahawk...they offered us several strands of beads for which were accepted." The Teninos had bargained in good faith, knowing that once the expedition was committed to traveling by land their canoes had little or no value. In response to the residual frustration of the failure of the grand strategic trading plan, the hard bargaining positions of the Indians downstream, and the hardships endured by the tight-knit party, Lewis demanded and got at least a small victory. They were loaded up by two o'clock in the afternoon and with "6 fathoms of white beads" in their packs they "proceeded up the river between the hills and its North shore," continuing the homeward journey by land across the barren Columbia plain.

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# LEWIS & CLARK IN COLUMBIA RIVER COUNTRY



Portion of 1803 map of northwestern territories, untitled, by Nicholas King. Library of Congress Geography and Map Division, Washington, D.C.



# LEWIS & CLARK IN COLUMBIA RIVER COUNTRY

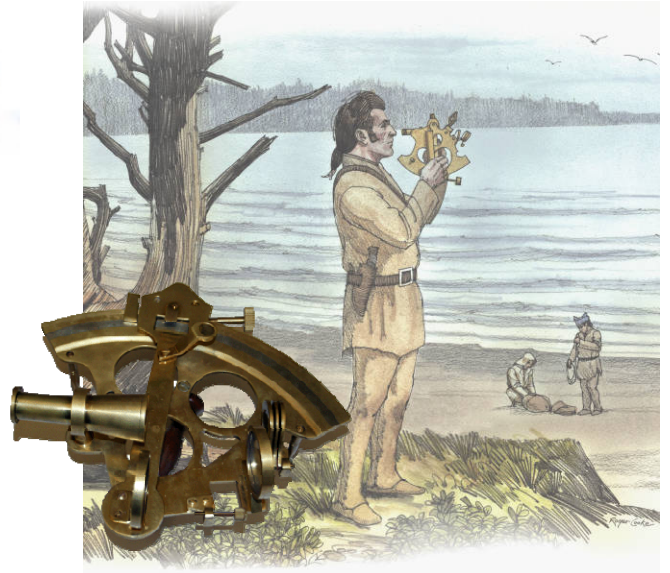


Portion of the 1806 map by Meriwether Lewis and William Clark, titled "Map of part of the continent of North America: whereon is laid down the Missouri... and the Columbia Rivers, from the Mississippi to the Pacific Ocean." Courtesy of Boston Athenæum.

# LEWIS & CLARK IN COLUMBIA RIVER COUNTRY

## STUDENT WORKSHEET

Name \_\_\_\_\_



The painting to the right, *Clark's Survey*, by Roger Cooke shows William Clark looking at the ocean by using a sextant (device pictured right). Washington State Historical Society Collection.

SPEED EQUATION:	Speed = $\frac{\text{distance}}{\text{time}}$	Units: $\frac{\text{miles}}{\text{hour}}$ (or MPH) or $\frac{\text{meters}}{\text{second}}$ (or mps)
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1. Actual measured hallway <b>distance</b> :		2. Convert the distance from feet and inches to <b>miles</b> . [HINT: 1 mile = 5280 feet]	
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3. Record the measured walking **times** from the trials.

Trial #1	Trial #2	Trial #3	Trial #4	Trial #5	Trial #6

3. Calculate the <b>average</b> speed from the data collected.	SHOW ALL WORK				
--	---------------	--	--	--	--

4. Convert the <b>time</b> from minutes and/or seconds to <b>hours</b> .	SHOW ALL WORK hours				
--	------------------------	--	--	--	--

5. <b>Speed</b> is measured by the rate of <b>distance</b> per unit of <b>time</b> taken to travel it.	<b>HINT:</b> Divide the total miles by the total time to determine MPH.	miles from #3		miles	
		time from #6		hours	
					(mph)

6. Record the length of Lewis & Clark's trip.	<b>miles</b>	Calculate the number of times you would have to walk the length of the hallway to match the length of Lewis and Clark's journey.	<b>HINT:</b> Take the length of the trail and divide it by the length of the hallway
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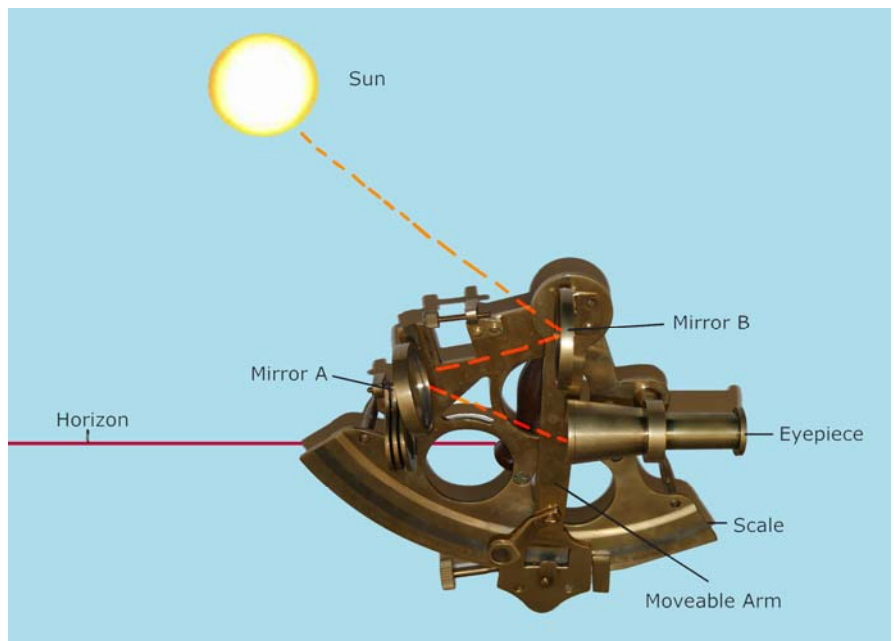
7. How long did Lewis and Clark's journey take?		months		<b>Days</b> (assuming 30 days per month)
8. Divide <b>total distance</b> by the <b>total time</b> to determine MPH.  HINT: 1 day = 24 hours	Use miles from #6		<b>miles</b>	
	Use days from #7		= <b>hours</b>	<b>(mph)</b>
9. What assumption is made here when calculating the speed of their travel?				

### How does a sextant work?

Lewis and Clark used several tools to help them in their journey to the Pacific Ocean. Among these tools was a sextant, a device used to calculate the angle between two objects.

This angle is calculated with the use of two mirrors. The diagram on the right displays how these mirrors were used. One of the mirrors (A) is half-silvered which allows some light to pass through its surface. In order to navigate, you use this mirror (A) to look at the horizon.

Mirror B is attached to a moveable arm. This is the mirror where light from an object (the sun in this diagram) reflects.



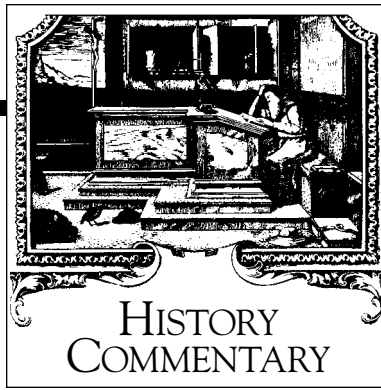
You can move the arm to a position where the sun's reflection off Mirror B also reflects off Mirror A and through the eyepiece. When this happens, you can see one object (in this case, the sun) superimposed on the other (the horizon). The scale can then be used to read the angle between the two objects.

This tool was so useful to Lewis and Clark because of its accuracy. An angle can be measured to the nearest ten seconds. (A degree is divided into 60 minutes; a minute is divided into 60 seconds.) This reading can calculate lunar distance, longitude and where the viewer is located on the earth.

### Why is it called a sextant?

This tool is one sixth of a circle and "sex" is the Latin word for six.





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## The Vote: “Station Camp,” Washington

By Dayton Duncan

On November 2, 1805, the Corps of Discovery completed its descent through the last of the great cataracts of the mighty Columbia River—a harrowing series of waterfalls, gorges and rapids that had begun with Celilo Falls nine days before.

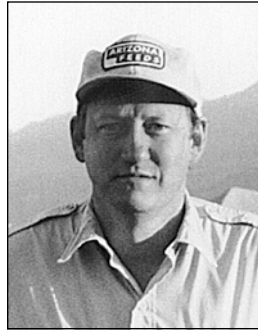
Early that morning the expedition’s dugout canoes were prepared for the final mile and a half of rapids. Hollowed out from Ponderosa pines only a month earlier when they were back with the Nez Perce, these dugouts were big and bulky, hardly designed for quick maneuvering in white water. Nevertheless, the expedition’s best boatmen put them onto the current and then steered madly as these floating tree trunks shot through the foaming chaos of water and rock. One of the canoes, Clark noted in his journal, struck a rock and split a little; three others took in water during the wild ride.

All in all, this final hazard, roughly four miles of boiling rapids and falls that William Clark called “the Great Shute,” was surmounted safely. Clark had taken the precaution to order most of the baggage removed from the canoes earlier in the day and portaged around the rapids. And for this job, he says, he “dispatched all the men who could not swim.” That’s a prudent commander for you—always getting the most out of his men, whatever their shortcomings. But it does beg a question about their recruitment back on the far side of the Mississippi nearly two years earlier. If you were about to set off on an expedition across the continent to find an all-water route to the sea, wouldn’t one of the top requirements be the ability to swim?

It must have been a great relief—for swimmers and nonswimmers alike—to load up the canoes below the final rapids and ease onto the broad Columbia. Relief, followed by excitement, because each mile they traveled now gave them new evidence that they were at last nearing the ocean.

They noticed a tidal rise of 9 inches on the river’s shore and, a day later, an 18-inch rise and fall. On November 3 they passed the point where Lieutenant William Broughton, sailing upriver from the sea during Vancouver’s expedition of 1792, had turned his ship around and headed back to the Pacific; they had finally emerged from a blank map to reach previously explored territory.

Better yet was news from the people Clark called “our Indian friends.” “Towards evening,” Joseph Whitehouse wrote in his journal, “we met several Indians in a canoe who were going up the River. They signed to us that in two sleeps we should see the ocean vessels and



white people.” According to Clark, that same day a large group of Indians in two canoes, coming upstream from the Columbia’s mouth, “informed us they saw 3 vessels below.”

Imagine the talk in camp that night. Three ships with white people only “two sleeps” away! To fully understand how electrifying that news must have been, consider what they had just been through. When they left Fort Mandan in North Dakota back in April, they had expected to find the fabled Northwest Passage, follow it through the single line of mountains conjectured on their maps, reach the ocean in late summer, and then head back east, perhaps return to Fort Mandan before winter. That was the theory.

Instead, they encountered one unexpected obstacle after another, time-consuming delay after time-consuming delay:

- ☉ A week deciding whether the Marias River was actually the Missouri.
- ☉ Nearly a month, instead of half a day, portaging around the Great Falls, which turned out to be five waterfalls instead of one.
- ☉ The agonizingly slow ascent of the Jefferson and Beaverhead rivers, taking them parallel to the mountains instead of through them.
- ☉ And then, at Lemhi Pass, the unexpected obstacle to trump all others—mountains, where mountains were not supposed to exist. No Northwest Passage. No short portage. Instead, weeks of stumbling through the Bitterroots—cold, wet, starving, and as close to lost as the Corps of Discovery ever found itself.

And let’s not forget what emotional toll was exacted each time their canoes picked up speed and headed toward the thunder of yet another Columbia River chute and cataract. Even the swimmers must have come to dread that sound.

But now came the promise of a reward for all that toil and trouble: three ships only “two sleeps” away—ships that could replenish their increasingly short supply of trade goods; ships that could provide them with news from home and, more importantly, take back news of their great achievement; ships that could provide them with the first whiskey they had tasted since they drained their last barrel on the Fourth of July at the Great Falls. All of that, only “two sleeps” away.

On November 4, at a large Indian village where the men feasted on wapato, Clark noted “uriopian” goods everywhere he looked: guns, powder flasks, copper and brass trinkets, some tailored clothes. Farther down river, Sergeant John Ordway says, they met an Indian who “could talk & speak some words of English such as curseing and blackguard.”

On November 6, according to Clark, they met another English-speaking Indian. This man told them a “Mr. Haley” traded regularly with them at the river’s mouth not far away. That night the men recorded a tidal rise and fall of three feet.

By the following morning they must have been bursting to put their paddles in the water. The anticipation was as palpable as the morning fog, so thick they couldn't see across the river. But on they went, piloted through the dense mist by an Indian wearing a sailor's jacket. They stopped at another village, and once again, according to Whitehouse, Indians "made signs to us that there were vessels lying at the Mouth of this River."

"We proceeded on," Ordway wrote, and for the first time since the morning they had left Fort Mandan in April, that phrase had more expectancy than resigned perseverance embedded in it. At last the fog lifted—and the Corps of Discovery was treated to a breathtaking, heartstopping vista. For the first time in a long time, the western horizon offered them something other than a discouraging surprise.

"Ocian in view!" Clark wrote in his notebook, cracking open exclamatory points like champagne corks. "Ocian in view! O! The joy."

They encamped that evening opposite Pillar Rock. Though the journals make passing mention of dampness and difficulty finding a suitable place for the night, there's no mistaking the emotion of the day. "Great joy in camp," Clark wrote, "we are in view of the Ocian, this great Pacific Ocean which we [have] been so long anxious to see."

Those familiar with this story already know that Pillar Rock is hardly on the Pacific shore. It wasn't the ocean that Clark was so excitedly describing—it was Gray's Bay. I imagine that Clark himself quickly realized this. But after traveling more than 4,000 grueling miles up the entire length of the Missouri, across those tremendous mountains, and down the treacherous rapids of the Clearwater, Snake and Columbia—and given the anticipation that had been building steadily for five days—he can be forgiven for jumping the gun by a few miles.

Let's give him and the rest of the Corps of Discovery this moment of jubilation. Let them savor it: "Ocian in view! O! The joy." Let them bask in their joy. They earned it. There's another reason to give them that moment, because on the next day, November 8, they received their official early-winter welcome to the Pacific Northwest, and they realized once more that nothing ever came easily for the Corps of Discovery.

A typical November coastal storm engulfed them as they inched along the shore of Gray's Bay, restricting them to only eight miles that day. Some Indians bearing salmon for trade blithely passed them in their elegant canoes, but the swells rolling in from the ocean storm rocked the expedition's lumbering dugouts so badly that several men got seasick. So did Sacagawea, who had been longing like the rest of them to see what her people called "the Stinking Lake." Those dugouts, crucial as they were to the Corps of Discovery, turned out to be even more poorly suited for the rough waters here at the Columbia's mouth than they had been for the river's rapids.

The words "wet and disagreeable" appear in several journals that day, a phrase that would soon replace "we proceeded on" as the expedition's mantra. "We are all wet and disagreeable," Clark wrote, "and we are at a loss to . . . find out if any settlement is near the mouth of the river." The waves forced them to stop near Gray's Point, where they camped in the margin between the high and ebb tides.

In the night, the high tide overwhelmed them, and they scrambled to save the canoes and their baggage from destruction. Things only got worse the next day. It rained hard all morning, and as the wind picked up with the afternoon floodtide, huge driftwood logs—some of them 200 feet long and 7 feet in diameter—were loosened from

the shoreline and sent crashing and thrashing around the campsite, now inundated with water.

With "every man as wet as water could make them," Clark reported, "every exertion and the strictest attention by the party was scarcely sufficient to defend our canoes from being crushed to pieces."

Some of the men had been drinking the brackish water of the estuary, and it had a laxative effect on them like a dose of Rush's Thunderbolts. Patrick Gass tells us the only fresh water to be had was found in the rainwater collecting in the canoe bottoms. For obvious reasons, they did not "proceed on" that day; they camped again in the same spot, at a place Clark called "Dismal Point."

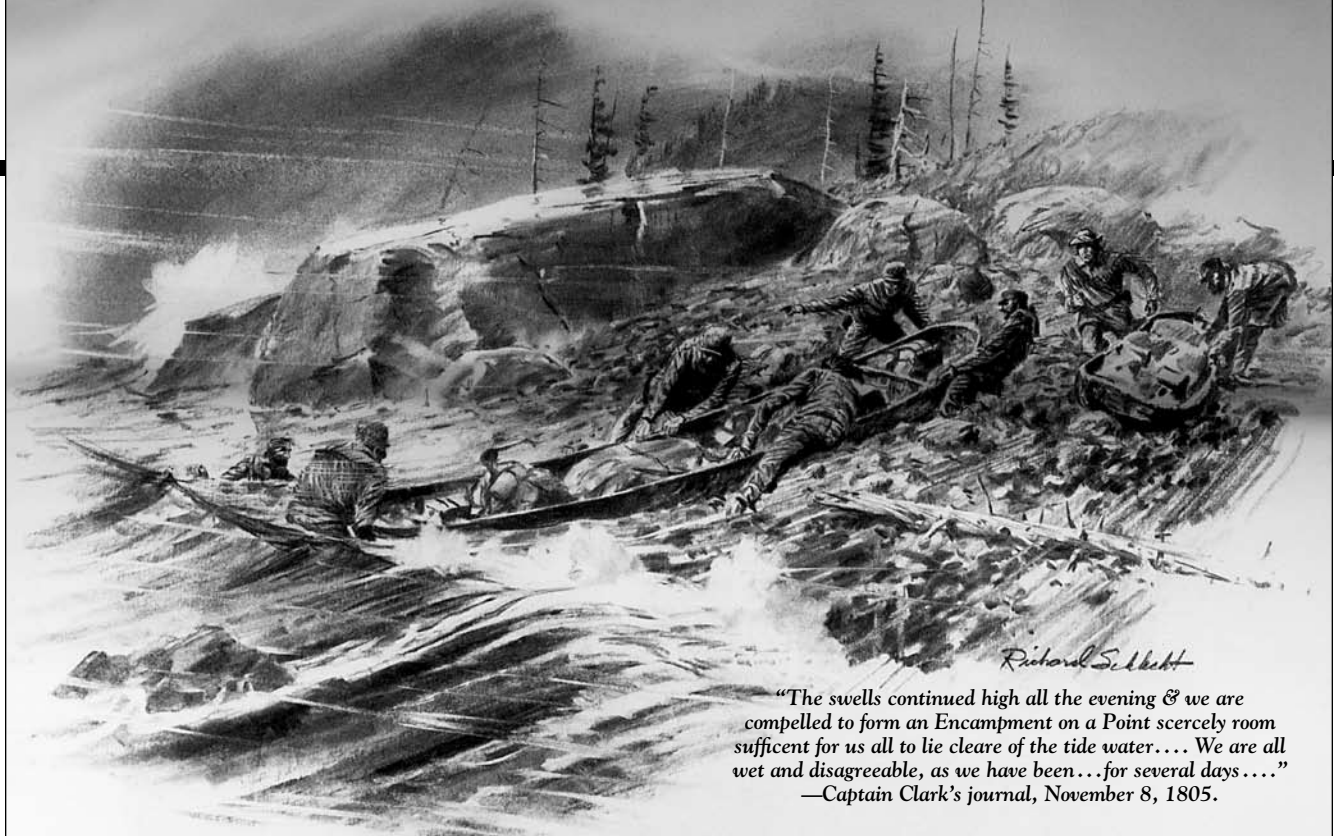
But they were, to borrow a phrase, "undaunted." "Notwithstanding the disagreeable time of the party for several days past," Clark wrote that night of his crew, "they are all chearfull and full of anxiety to see further into the ocian." They had been through violent storms before out on the Great Plains, and they must have assumed that this one would pass just as those had. They couldn't have been more wrong. On the morning of November 10, the storm still raged. During a lull they loaded their dugouts and left Dismal Point, hoping to round Point Ellice and reach the coast. But as they approached the point, the wind and waves returned, forcing them to do the one thing the Corps of Discovery hated more than anything else: retreat and give back two hard-earned miles.

They unloaded their canoes, waited for the low tide, loaded up again, and tried once more to round Point Ellice. Furious waves defeated them again, forced them into another begrudging retreat to find a spot to camp for the night. This one was even worse than the previous campsite. They stowed their baggage on high rocks but searched in vain for an adequate place to sleep. "Here we scarcely had room to lie between the rocks and water," Patrick Gass wrote, "but we made shift to do it among some drift wood that had been beat up by the tide."

Whitehouse wrote that during the day they could watch porpoises, sea otters, ducks and sea gulls in great abundance, but all they had to eat that night was pounded fish purchased farther up the river. Their hopes—like the tides—had risen and fallen twice during the day. Adding to the indignity, the point that had turned them back now blocked any view toward the ocean they had been "so long anxious to see." Today we call it Point Ellice. On Clark's map it appears as Point Distress.

The storm pinned them there for four days. Without tents, they tied blankets and mats to poles in an effort to protect themselves from the rain as they huddled on the driftwood. But each high tide forced them to temporarily abandon even this makeshift camp and cower in the rocky crevices until the water receded. More misery. The steady rain saturated the soil on the steep slopes above them, and small stones began sliding off onto them. More misery. At three in the morning on the 12th, the storm sent sheets of lightning and hail against the exposed crew. There was a short period of clearing light at dawn. Then an ominous black cloud rolled in from the southwest and, as Clark wrote, "the heavens became darkened." Then followed more hard rain and wind, and waves that were the highest yet.

In the midst of the gale some Cathlamets paddled up, stopped briefly to sell the hungry explorers 13 sockeye salmon, and then, as if the huge swells were nothing out of the ordinary, they paddled on downstream and out of sight. The men watched them depart, envying both their seaworthy canoe and their nimble skill in such rough waters. "They are on their way to trade those fish with white people," Clark noted, "which they make signs live below, round a point."



“The swells continued high all the evening & we are compelled to form an Encampment on a Point scarcely room sufficient for us all to lie clear of the tide water. . . . We are all wet and disagreeable, as we have been . . . for several days . . .”  
 —Captain Clark’s journal, November 8, 1805.

Richard Schickel/NCS Image Collection

The captains then dispatched three men to attempt another passing of Point Distress—to see if they could find those white men, or at least a better bay for a decent campsite. The point defeated them once more. They tried again the next day. This time Colter, Willard and Shannon made it around Point Distress and disappeared. Back at camp there was nothing to eat again but pounded fish. Whitehouse wrote that his buffalo robes were falling apart. Ordway reported that the storm continued raging. Gass summarized it as “another disagreeable rainy day.”

Something about this situation seems to have brought out the best in William Clark’s journal writing. Meriwether Lewis was in the midst of one of his long gaps in record-keeping—more than three months in this case—but Clark rose to the literary occasion.

From the moment he wrote “O! The joy,” his journal entries seem to be more descriptive than usual and filled with empathy for the plight of his men, reflecting what must have been going on in both captains’ minds. On the 12th he wrote:

*It would be distressing to a feeling person to see our situation at this time, all wet and cold with our bedding &c also wet, in a cove scarcely large enough to contain us, our baggage in a small holler about 1/2 a mile from us, and canoes at the mercy of the waves & drift wood. . . . Our party has been wet for 8 days and is truly disagreeable, their robes & leather clothes are rotten from being continually wet, and they are not in a situation to get others, and we are not in a situation to restore them.*

By November 14 his concern had deepened. The robes and half of the few clothes the men still had were now rotted away. He could see snow on the high mountaintops to the south. “If we have cold weather before we can kill & dress skins for clothing” he wrote, “the bulk of the party will suffer very much.” Earlier he had called their situation disagreeable. Now, he said, “Our situation is dangerous.”

That afternoon, Colter arrived back in camp by land with his report from the scouting mission. The news was discouraging: No sign of white men. But, said Colter, if they could manage to get beyond Point Distress, there was a sandy beach for a better encampment.

Lewis decided to set off on foot with four men to scout farther up the coast for trading vessels. Clark was to lead the rest of the party on one more attempt to round the point.

That night, I think, was one of the low points for the Corps of Discovery. Patrick Gass wrote that this weather was “the most disagreeable I had ever seen.” That’s a telling statement from someone who had gone through a North Dakota winter of 45 degrees below zero and howling winds; blistering hot days in Montana punctuated by hail storms that had knocked men to the ground and the constant presence of mosquitoes that made every day a slow torture; and then snow squalls in the Bitterroot Mountains where some of the men had walked with rags wrapped around their feet. But the storm at Point Distress, according to Gass, was worse than all that—“the most disagreeable I had ever seen.”

Anyone who’s done any camping knows how miserable it can be during a rainstorm. Hot weather can be uncomfortable; cold weather and snow can be uncomfortable—even dangerous. And yet there can be an exhilaration about meeting the challenge of those extremes. Rain, on the other hand, is dispiriting even with the best of camping equipment to keep you moderately dry. Imagine camping in the rain without tents. Imagine that rain going on day after day, night after night, for two weeks, rotting your clothes away.

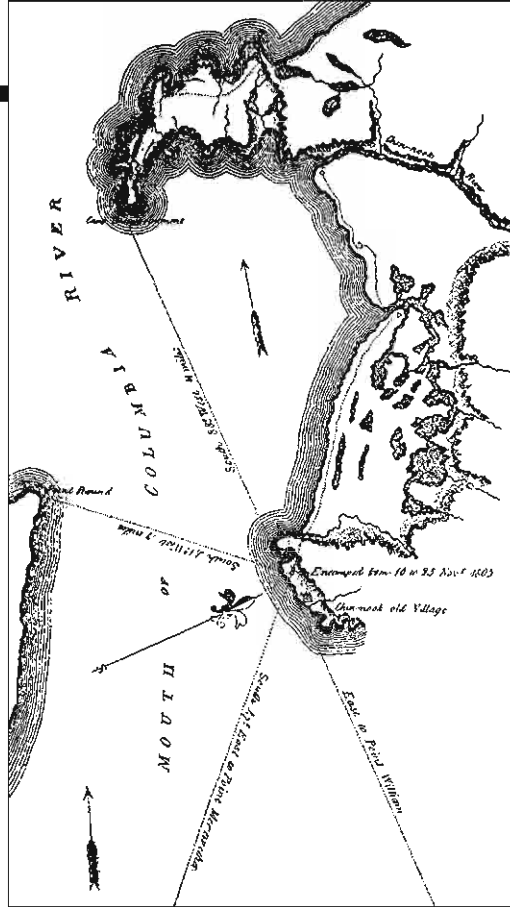
Gass’s statement tells us as much about psychology as the weather. It tells us the expedition’s state of mind. Clark shows us even more. This was, he wrote, “the most disagreeable time I have experienced, confined on a temp[estuous] coast, wet, where I can neither get out to hunt, return to a better situation, or proceed on.” Unable to “proceed on”—can you imagine a worse feeling for the Corps of Discovery?

On November 15 everyone was itching to move. The wind stopped them once more, but during a brief pause in the afternoon they were finally able to round Point Distress, go past an empty Chinook village of 36 houses, and reach what came to be called Station Camp. George Shannon joined them from his scouting mission with five Indians. The only white men he had seen were Lewis and his party, heading on their own reconnaissance.



The high tide and big waves convinced Clark to set up camp. There was no use in trying to go any farther, he noted. From here they could survey the entire mouth of the Columbia. He called this bay Haley's Bay, after the man they had heard so much about but never met. Station Camp would be their home for ten days. "Here we formed a comfortable camp," Gass wrote, "and remained in full view of the ocean, at this time more raging than pacific."

Their first full day, the 16th, got off to a good start. The weather cleared enough for them to put out articles to dry, and the hunters were dispatched. They returned with two deer, a crane and two ducks. York, Clark's slave, added to the larder with two geese and eight brants he had shot. That night's meal must have seemed like a feast.



Special Collections, Washington State Historical Society

*This map from the first published version of the Lewis and Clark journals shows the mouth of the Columbia River. The north/south directional arrow points to the location of Station Camp. The land protuberance below "Chin-nook old Village" is Point Distress.*