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Article Summary: Engineers brought scientific method to the examination of the Missouri River Basin. They found a railroad route into the west and helped open the continent.

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Photographs / Images: Samuel Seymour's painting of Major Stephen H Long's council with the Oto, October 3, 1819; Gouverneur Kemble Warren; John Charles Fremont; Jessie Benton Fremont

Four Engineers on the Missouri: Long, Fremont, Humphreys, and Warren

By Lawrence C. Allin

The romantic trapper, fur trader, and riverman are generally credited with exploring the West and opening it to settlement. The Army Corps of Engineers should be given equal status with these adventurers as a hard-working cadre of explorers. Four of these soldier-scientist-builders are in the front rank of those who opened up the Missouri River Basin: Major Stephen H. Long, Captain John Charles Fremont, Colonel Andrew A. Humphreys, and Lieutenant Gouverneur Kemble Warren.

Each of the groups who opened the West had peculiar talents. The trapper lived by his keen wit, thorough understanding of nature, and star-guided mentality. The traders were full of business cunning, an understanding of nature, and a willingness to exploit available resources. The rivermen functioned with natural wisdom, an understanding of the basin's hydrology, and a keen and calculating business eye. The Army engineer brought a different outlook and set of values to his wide-ranging work. He was college-trained, usually at West Point, possessed of some 19th century scientism which drove him to search for order in the natural world and had an understanding of and willingness to work with the modern technology. An agent of the government, he possessed a large view of national policy and the West and its opportunities and limitations.

The engineers had two peculiar points of view which set them apart from the other pioneers, who, admittedly, gave the soldier-explorers much knowledge. These points of view were geographic and technological. Their world-view embraced the largest dimensions of cultural and physical geography while their technological purview was broad but

for our purposes focused on the application of steam power to riverboats and railroads. A good example of such an engineer was Long.¹

Dartmouth-educated, Long gained experience of rivers and the wilderness in 1817 when he inspected the nation's frontier defenses from the Arkansas River to the site of present-day Minneapolis. He went by river and used a six-oared skiff during his inspection. On March 15, 1817, he wrote Secretary of War John C. Calhoun recommending that steam-powered vessels be used in such future assignments. Calhoun in turn proposed an exploration of the Missouri by steamer to President James Madison. Calhoun and Madison were enthusiastic because such an undertaking could neutralize Lord Selkirk's (Thomas Douglas) Red River Colony and the Hudson Bay Company/Northwest Company "fur war" which threatened both the American fur trade and possession of the Upper Missouri.²

Calhoun and Madison ordered Long's steamboat exploration of the Missouri, but he was to accompany a strong military force to the Mandan Villages. The larger force, the Yellowstone Expedition, was also to be steam-powered and it was to forestall British incursions into American territory as well as to protect the American fur trade. Importantly, Long's party was composed of a number of brilliant scientists who would conduct the first scientific exploration of the Missouri.³

For most purposes Long's party conducted itself independently of the Yellowstone Expedition. The major's first independent chore was to build and launch his steamboat at the Allegheny Arsenal. She was the 75 x 13 *Western Engineer* which drew only 19 inches of water and had a stern paddle wheel. Amidst the booming of a 22-gun salute—one for each state in the fledgling republic—the *Western Engineer* left Pittsburgh for the Missouri on May 5, 1819.⁴

The unique vessel made her shakedown cruise steaming down the Ohio River to St. Louis. It was a time of training for her crew and a period of planning and testing for the civilian scientists. On reaching St. Louis, Long found that the troops of his leader, Colonel Henry Atkinson, were scattered from Jefferson Barracks to Fort Leavenworth. Furthermore, one James Johnson of Kentucky was to carry the troopers and their

supplies to the Yellowstone River aboard five deep-draught Ohio River steamboats. The trip up the river would be difficult. No advance parties had cut wood for fuel. Shifting sandbars, channels, and stationary rocks awaited their keels, and winds reached out to drive them ashore. Groundings and delays to cut wood were frequent, while the repeated necessity of tying up to clear Missouri River silt from the boilers and valves made the going slow.⁵

Of Johnson's vessels two did not reach the Missouri. His *Expedition*, *R. M. Johnson*, and *Jefferson* continued up the Missouri River but were unable to move men and supplies past the mouth of the Kansas River. The *Western Engineer* sailed on up-river alone.⁶

Atkinson's men struggled to Lewis and Clark's Council Bluff, built Cantonment Missouri, and began to die of scurvy and disease during the winter. Long encamped his men a mile above Manuel Lisa's trading fort and eight miles downstream from the swampy area where Cantonment Missouri had been built. The *Western Engineer* was anchored in the stream, and Long hurried back to Washington for further orders. The scientific party wintered at Engineer Cantonment and contemplated the *Western Engineer*. She had proven that the Missouri could be navigated by a steamer and would give further service on the lower reaches of the stream.⁷

Johnson's vessels were unable to support Atkinson's disease-ridden troops; there was apprehension about the British presence in the area. Calhoun and Monroe decided to halt the Yellowstone Expedition. To compensate for the aborted expedition and to utilize Long's trained scientists, they gave him a more modest mission. He was to lead a Rocky Mountain Expedition up the Platte to the mountains and down the Red River border with the Spanish colonies. Exploring that border was vital, since John Quincy Adams had just concluded the treaty with Spain which drew the line and let the United States touch the Pacific. And too, Lieutenant Zebulon Pike had not covered all of that immense ground during his 1806 western trek.⁸

Long's stellar scientists could both learn much to tell the nation and show the flag. They were a brilliant group drawn from Philadelphia's Peale Museum, Academy of Natural Science, and American Philosophical Society. Only Dr. Ed-

win James, the expedition's chronicler and botanist, was not a Philadelphian, but he had been trained in Albany, New York. Samuel Seymour was the group's painter, Titian Ramsey Peale its scientific illustrator, and Augustus E. Jessup, of the Academy of Natural Science, its geologist. Dr. Thomas Say, lately of New Harmony, Indiana, was the group's leading mind and a botanist. He was unquestionably brilliant, had founded the academy, and was one of the first to use fossil evidence in scientific investigation.⁹

On June 6, 1820, the small group, 20 in all with interpreters, riflemen, and other support personnel, left Engineer Cantonment. The party journeyed up the north bank of the Platte and met Pawnee and Oto Indians. After finding Long's Peak and the Rockies, it journeyed down the South Platte to the Arkansas watershed. There the party split, with Captain John R. Bell taking Say and Seymour and some soldiers down the Arkansas. Long, with James and Peale, struck out for the Red River. They missed it, ran into hostile Indians, and had to eat their own horses before eventually meeting the other party at Belle Point in Oklahoma. Three of Bell's soldiers deserted, stealing some horses and the party's precious journals.¹⁰

Long, James, and Bell wrote reports of their trek and Long earned fame from the map of his travels that he drew. On his map Long labeled what would be the Dust Bowl of the 1930s as the Great Desert. Sending settlers there was out of the question, he wrote, and given the technology of the 1820s, he was right. There was little timber for houses or fuel, scant surface water, sandy soil, hard winters, vast buffalo herds, hostile Indians, and no easy means of communication. Long said that the area should not be settled: better that it should serve as a buffer against the Spanish, British, and Russians, who shared the continent with the Americans. And too, he said, the eastern wooded portion of the country should be filled up before the republic attempted any further extension westward.¹¹

After 1820 the tide of settlement halted at the Missouri, but the fur trade grew. To give that trade more scope and geographic knowledge, the famous Pierre Chouteau Jr. of St. Louis engaged the eminent French mathematician Joseph Nicolas Nicollet to explore the upper reaches of the Missouri. He did so in 1835. In 1838 Colonel James J. Abert remade the



Expedition artist Samuel Seymour executed this painting of Major Stephen H. Long's council with the Oto, held October 3, 1819, about six miles north of present-day Florence.



Gouverneur Kemble Warren

Corps of Topographical Engineers and hired Nicollet to work for the government.¹²

Nicollet, a member of the French Legion of Honor, was given the assistance of a young topographical engineer named John Charles Fremont. Fremont had already made one exploration—of the Cherokee country at the corners of North Carolina, Tennessee, and Georgia. With Nicollet or on his own, he would conduct seven other inquiries into the country and become a national hero. Most of his explorations touched the Missouri River Basin.¹³

In 1838 Fremont journeyed to St. Louis to rendezvous with Nicollet and met the town's leading citizens, including another corps officer, Robert E. Lee. From St. Louis the party journeyed to Fort Snelling and on to the Minnesota prairie. There Fremont met Henry Sibley and Joseph Renville Sr., who had been an interpreter for Zebulon Pike. With Nicollet and Charles Geyer, a Dresden-born botanist, Fremont made his way across the Choteau des Prairies to the red pipestone quarry on the edge of the Missouri Basin.¹⁴

With winter coming on he and Nicollet returned to Washington where they proposed to finish their military and geographical survey inquiring into the Upper Missouri Basin. Permission to do so was given and in the spring they rendezvoused in St. Louis. After busy preparations the party boarded the steamer *Antelope* for a 1,200-mile sail up the Missouri to Fort Pierre.¹⁵

At Fort Pierre, Fremont encountered the Prairie, Yankton Sioux, and the mountain men. Geyer was again with the party and Louis Freniere, William Dixon, and the great Etienne Provot would guide it. Stowing their gear on one-horse Red River carts, the party set out to explore the Cheyenne and James River Basins, where Fremont witnessed a buffalo surround. Using the scientific method learned from Nicollet, he helped him map Devil's Lake. The party also explored the lakes at the head of the Big Sioux River.¹⁶

The party returned to St. Louis, and Fremont and Nicollet went on to Washington, where they created a superb map and wrote a report of their explorations. Nicollet did three outstanding things in those years: (1) He made the Army's first successful use of barometers to measure land altitude; Long had tried to but this barometers were broken early on. (2) He

correlated cretaceous fossils of the Northwest with similar forms in New Jersey and advanced the state of geology. (3) He encouraged Fremont.¹⁷

By 1840 Thomas Hart Benton and others were crying for expansion and many wanted to push beyond the great bend in the Missouri at Kansas City. But the way had to be shown and the land made known. And, Fremont was to come into his own by marrying Benton's bright, beautiful daughter Jessie and becoming the leading explorer in the Missouri and beyond. The Panic of 1837 was over, the country was more optimistic, and Texas wanted annexation. It was time to push down the three great routes to the West. The southernmost still led into Mexican Territory, and the route up the Missouri toward the lush valleys of Oregon was long and tedious. The central overland route to Oregon needed to be delineated. The westering hunger known as Oregon fever infected the nation, and settlers ready to move West wanted both a survey of the route and a description of the territory. By 1842 Fremont was ready to give them both.¹⁸

There was a real need for such information. Lewis and Clark, Pike, and Long had only filled in a few spots on the map, and the mountain men had given no real help to the westering settlers for several reasons. The unschooled mountain men were knowledgeable of the West, but ignorant of how to describe it in the written word or cartographic terms. And too, no mountain man knew the entire West, although he might know a small portion of it better than any man alive. To remedy the situation, Fremont persuaded J. J. Abert to give him orders to march to the Rockies via South Pass, scrutinize the terrain, survey and describe it, and search for suitable locations for forts.¹⁹

Much has been said of Fremont's expeditions of the 1840s as being secret missions as well as for exploratory and diplomatic purposes. Certainly Benton and Fremont wanted to end the Anglo-American condominium in Oregon by inducing "30,000 American rifles" to settle there. But the basic purposes of Fremont's explorations were to dramatize the West and gather scientific and economic information concerning its potential.²⁰

On May 2, 1842, Fremont began his first great expedition. At about the same time Charles Dickens, the English author, visited the West. They returned to describe two different

American Wests. Fremont's we remember. Another foreigner who accompanied Fremont was Charles Preuss, his invaluable cartographer. They headed for St. Louis, where Cyprian Chouteau helped them outfit and secure experienced companions, among them Lucien B. Maxwell, Henry Brant, Basil Lajeunesse, and 19 voyageurs. Departing St. Louis for Chouteau's Landing below Westport, Missouri, Fremont met Kit Carson aboard the steamer *Rowena*. It was probably not a chance meeting; Carson was a friend of Maxwell's.²¹

When the expedition left the Missouri settlements it was uniquely equipped. Its gear was transported in eight Red River carts and included evidence of Fremont's adaptability to technology. One was a 5 x 20-foot inflatable rubber boat he had designed. Another was an image-making daguerreotype apparatus. Fremont was probably the first explorer to use such an apparatus and tried unsuccessfully to capture the Devil's Gate on its glass.²²

The column struck up-trail paralleling the Kansas River, then across to the Platte. It then entered upon the well-known Platte River Road. On June 27 the explorers camped at Grand Island where they met the John Lee-Russell B. Sage party coming downstream after it had lost its boats and furs.

They camped near the junction of the North and South Platte Rivers, then headed for St. Vrain's Fort, 40 miles north of present-day Denver. Approaching the fort they saw "the shining mountains" and Long's Peak, rested, and proceeded to Fort Laramie.²³

There Fremont's moral courage was tested. No less an authority than Jim Bridger told him that the Sioux were on the prowl and that danger lay between him and the objective, South Pass. Fremont decided to forge ahead, since Dr. Elijah White and Langford Hastings had concluded to conduct an emigrant party up the trail at the same time. Thomas (Broken Hand) Fitzpatrick, White and Hastings' guide, pointed the way. Fremont's small group reinforced them as they marched through a drought-ravaged countryside, met no hostiles, and hardly knew it when traversing South Pass on the way toward the Wind River Range. There, on August 15, 1842, the party, with John Charles in the lead, climbed "Fremont's Peak." He unfurled a flag to proclaim American sovereignty and saw the beautiful peaks of the Tetons. Then Fremont turned toward home, confident he could describe the territory.²⁴

The party moved down the Platte and camped at Chimney Rock, near present-day Bridgeport, Nebraska. At one point a rubber boat overturned and some of the party, including Fremont, were almost lost. Farther east, at the Grand Pawnee village, they procured food from the Indians whom Fremont genuinely admired. At Bellevue, Nebraska, on the Missouri River, they met Colonel Peter A. Sarpy. Sarpy arranged to auction off the expedition's horses, mules, and carts, and at Fremont's request built a 10-oared mackinaw boat for a down-river trip.²⁵

Fremont hurried on to Washington. His brilliant and beautiful wife Jessie helped write his first laudatory report on the West. The document soared with rhetoric and symbolism; it became a guidebook. Americans did not want to read of the harsh country Pike and Long described. They wanted to learn of greener pastures. Fremont soon became a romantic hero and the quintessential symbol of expansion.²⁶

During the spring of 1843, 900 emigrants were on the Great Platte River Road headed West. Fremont, Benton, and the expansionists had to catch up with them with another more detailed survey, for 1,400 emigrants would follow the pioneers in 1844 and 3,000 in 1845. The Oregon Trail was to be as thoroughly mapped as Commander Charles Wilkes' naval exploring expedition had mapped the Columbia River, the Oregon country, San Francisco Bay, and the Sacramento River. The Oregon country was known and Americans were moving there, even before the route itself was fully known.

Fremont's 1843 expedition linked the Whig maritime commercial interests with the Democrats' internal and agrarian bias and helped unite the country, at least in thought. Fremont in 1843 would go beyond the Wind River Range, down the Columbia, survey and map the entire western road, and give precise details of the route's many good campsites.²⁷

When Fremont, now called Pathfinder, arrived at Westport, he assembled a crew of 39 western veterans. Among them were Lajeunesse and Zindel of the Nicollet treks, and Benton's 18-year-old black retainer, Jacob Dodson. Thomas Fitzpatrick hired on as a guide and Lucien Maxwell went out again as the party's hunter. Twelve large two-mule carts carried the explorer's gear while the scientific instruments went out in a light canvas-covered wagon. Preuss and Fremont were

the only scientists, since the affair was planned only to light the way. Each man was armed with a new Hall rifled, breech-loading carbine. When brilliant flashes were needed to overawe the Indians, there was a 12-pound mountain howitzer at hand. It had been authorized for Fremont's use by Colonel Stephen Watts Kearny. When Abert learned of this in Washington, he was furious, but ever-alert wife Jessie thwarted his orders for Fremont to return and explain himself.²⁸

There was also the possibility that a new route could be found to penetrate the Rockies south of South Pass. Fremont struck out trying to locate the southerly route to the Pacific. He went up the Kansas River, fell in with the B. S. Chiles wagon train, and spent his fourth night out in the company of Dr. Marcus Whitman. The party moved from the Kansas to the Republican River valley, through sandy and broken terrain, and on to the Big Timbers near Bent's Fort on the Arkansas River. There, Fremont sent Fitzpatrick on and left the heavy wagons at St. Vrain's Fort in order to expedite his movements. At St. Vrain's, Fremont got news and supplies and rode south through Lupton's farm, now Fort Lupton, Colorado. The explorers camped on Cherry Creek and crossed the upper Kiowa and Bijou Creek valleys. The party marched through the Front Range of the Rockies into South Park, source of the South Platte River, looking for a new route west. They became discouraged when they found that there was none, and headed for a new village, Pueblo. Jim Beckwourth the mulatto mountain man, had created it to keep the free trapper prosperous in the declining fur trade. While Fremont and his men rested, Kit Carson arrived as planned from Bent's Fort.²⁹

Fremont returned north to St. Vrain's to meet Fitzpatrick and engaged Thomas Fallon and Alexis Godey, a mountain man, to travel with him. Again splitting his group, he aimed for the Great Salt Lake, which Jim Bridger had discovered. Fitzpatrick traveled over the well-known trail to the north, while Fremont attempted to find a road up the canyon of the Cache la Poudre in the Long's Park area. Thwarted, the Pathfinder crossed Box Elder Creek and the Big Thompson River and headed for the Hudson Bay Company's post at Fort Hall on the Snake, well into the Rockies on the west slope.³⁰

Fremont led his party on to the Columbia River, paddled a canoe to Fort Vancouver and turned south along the Sierra Nevada Mountains, hoping to find the basin-draining Rio Buenaventura. Taking a side excursion over the Sierras in January of 1844, the party plowed through snow, ate its mules, and barely made Johann Sutter's New Helvetia in the San Joaquin Valley of California. Moving down that garden paradise, the explorers crossed eastward into the desert at Tehachapi Pass and on to Las Vegas—then only springs and a lush sink meadow. Thereafter they endured terrible jornadas of mountain and desert before reaching the Middle Park in Colorado.³¹

Joseph Walker, another first-class mountain man, joined them at Las Vegas. He led the searchers until they hit familiar landmarks, the Arkansas River and Bent's Fort. They marched on to the Smoky Hill and Kansas Rivers, encountered Pawnee Indians but no shooting. Finally the party headed down the Missouri for St. Louis.³²

Again, his wife helped Fremont with his report on the expedition, while Preuss worked on maps. Fremont had proved that there was no Rio Buenaventura, and more importantly, rediscovered and explained the fact of the Great Basin between the mountains. And the way to Oregon had been more fully mapped. Brigham Young studied Fremont's reports and concluded that the Wasatch Benches near the Great Salt Lake were "the place" to establish the Latter Day Saints. Finally, with his sharp eye and articulate tongue, Fremont laid out the agricultural potential of California for all to read and for many to come and harvest.³³

Fremont's last exploring expedition as a topographical engineer began with tactical orders to survey the Arkansas River, and to demarcate the Red River and the 100th Meridian. His original orders were modified when Texas came into the Union. Fremont was given permission to send a party to explore the southern Rockies. War with Mexico loomed, and he was told to report to Washington by the end of 1845 in the event his knowledge was needed in the conflict.³⁴

Work on the report of his 1843-1844 expedition delayed Fremont and he had to leave Preuss in Washington to finish his map. Fremont hired cartographer Edward M. Kern before arriving at Westport. There he engaged old companions

Walker, Godey, Lajuenesse, and Maxwell. The party that headed out the Sante Fe Trail was the largest and toughest Fremont had commanded. He lingered for two weeks at Bent's Fort waiting for Kit Carson and dispatched young Lieutenant J. W. Abert to explore the Arkansas and Canadian Rivers and the Kiowa country.³⁵

Disobeying orders, Fremont assembled his command, rode through Tennessee Pass and across the western plateau of Colorado into Mexican Territory. The explorer-invaders crossed the Green River and descended to the Great Salt Lake. Fremont proceeded across the unknown Great Salt Desert toward Pilot Peak, Whitten Spring, and what became the ill-fated Hastings Cutoff. Furthermore, he divided his party. Walker took the main body down the Humboldt River of Nevada to Walker Lake and over the Sierras to California.³⁶

Profiting from his frigid experience of the winter of 1844, Fremont crossed the Sierras early through what came to be known as Donner Pass. Two years later he would bury the remains of the ill-fated emigrant party which gave Donner Pass its name. Striking down the beautiful gorges of the American River, the explorers missed the gold under their feet which later made Fremont rich. Reaching Sutter's New Helvetia again, Fremont was able to write: "By the route I explored, I can ride in thirty-five days from the Fountain River to Captain Sutter's: and for wagons the road is decidedly better."³⁷

Fremont went off to be embroiled in the nasty aftermath of the Conquest of California and a court martial, which found him guilty of mutiny, disobedience, and conduct prejudicial to good order. Although momentarily lost in the clamor of the Mexican War, his trial, and the Gold Rush, Fremont made other explorations. But what had he done? He had tried to disprove Pike and Long and failed in the face of reality. He had advertised and shown the way to Oregon and California, and he played a part in bringing them into the Union. He also helped the tide of Manifest Destiny wash over the Missouri River Basin. There were too many buffalo, too many primitives, too many acres, and too many allurements on the west for the watersheds sloping eastward from the Rockies to fill up with settlers. Instead of Long's frontier as a buffer, the Missouri Basin became a mere obstacle to be overleaped by progress.³⁸

After the Mexican War, the indefatigable Fremont was captivated by a new national impulse—the extension of railroad steam travel into the West. In concert with his father-in-law, Senator Benton, and backed by St. Louis businessmen, Fremont went West a fourth time in 1848 to find a bed for rails through the southern Rockies.³⁹

The Pathfinder had received medals from the Prussian government and British Royal Geographical Society. His geographical memoir of the third expedition had made him a respected scholar. But he was under a cloud as result of his court martial and grieved by the death of his son Benton.⁴⁰

When he assembled his 33-man party on the Missouri, Godey, Kern, and Preuss were with him, as well as five others who had served with him before. Three California Indians also had come east with the explorer and were to head for Mariposa Tract with him.⁴¹ They set out on October 21, reached Bent's Fort on November 16, and found the Arkansas River full of ice. Tribal Agent Fitzpatrick and trappers at Pueblo advised Fremont against a winter exploration.⁴² A gap between Walker Pass and Mono Lake in California was the destination of Fremont's first railway survey. The grade was to run directly west through the mountain fastness. Old mountain man William S. (Bill) Williams, equalled in his knowledge of the Rockies only by Jim Bridger, would lead.⁴³

The plan was to strike through the Sangre de Cristos, over the upper reaches of the Rio Grande Valley through Robidoux Pass, over the continental divide, across the San Juan Range, and the Great Basin.⁴⁴ From the onset the going was grim. The mules began to die because of intense cold and the scant ration of a pint of corn a day. By December 11 the party was in the San Juans, where Williams and Fremont disagreed as to the direction they should take. The party floundered; all the mules and 11 of the men died before relief came from Taos.⁴⁵ The expedition was an unmitigated disaster. Nonetheless, Fremont recuperated, rendezvoused at Santa Fe with 25 men and redirected his party southwestward toward the Gila River and California's Tejon Pass. Fremont believed his expedition a success in that he thought he had found an acceptable route for a transcontinental railroad.⁴⁶

By 1853 continental boundaries of the United States rested on two oceans, and a rail line was finished between New York

and Chicago. The next year the steel rails reached the Mississippi. There was a railroad convention at Iowa City in 1851 demanding that the rails move west.⁴⁷ It seemed as if the government would subsidize only one set of the rails to the West Coast. There was bitter sectional and urban rivalry, with St. Paul, Chicago, St. Louis, New Orleans, and even Fort Smith, Arkansas, wanting to be the terminus through which the commerce of the continent would flow.⁴⁸

To determine a definite route for the rails, Pennsylvania's Senator Richard Brodhead introduced a bill in Congress to direct the Topographical Corps to survey rail routes. By letting the engineers determine the way, politics would not dictate the route—he hoped. Secretary of War Jefferson Davis had to carry out the law but bypassed the Topographical Corps and created the special office of Pacific Railroad Explorations and Surveys with engineer Major William H. Emory its head. Emory held interests in the then paper city of San Diego. Emory's impartiality was suspect. Emory was replaced by Captain Andrew A. Humphreys. He was directed to get the surveys done and file a report in January, 1854.⁴⁹

Three strong men were among the rivals trying to gain the rail line to serve their sections of the nation. Jefferson Davis wanted it for the South but couldn't openly exploit his position to gain it. Senator Benton wanted it for St. Louis and constantly attacked Davis. Illinois Senator Stephen A. Douglas, a rail magnate, worked for a Chicago-Davenport-Council Bluffs-South Pass corridor. Because of the rivalry and time limitation, the engineers assigned to Humphreys' office had to make reconnaissances, or topographical surveys, not strictly right-of-way surveys. They were to learn distances, grades, passes, canyons, locations of bridges and tunnels, and what timber, stone, coal, and water were available. Scientists were to accompany parties to aid in blending nature and policy.⁵⁰

The lines Davis and Humphreys elected to survey attracted the most political support. They were the 47th-49th parallel corridor from St. Paul to the upper Missouri River to the Columbia Valley; 38th-39th parallel route from the Arkansas River to Fremont's Cochetopa Pass via Salt Lake; 35th parallel

from Fort Smith to Albuquerque to the Pacific, and a north-south line through California's San Joaquin Valley.

No survey was contemplated along the 32nd parallel, already surveyed by Emory, but it was decided to examine that prospect as well as other alternatives. The rails pointed to the fertile valleys of the Columbia, Willamette, Sacramento, and San Joaquin, with scant attention at first to prairies and plains of the Missouri River Basin.⁵¹

Former Corps officer Isaac I. Stevens, newly appointed governor of Washington Territory, led the largest, most elaborate survey party along the 49th parallel. When Stevens left St. Paul on June 6, his party faced the most difficult task of any expedition. It had to traverse the Missouri Basin at its widest and survey the Rockies and Columbia River Basin. No survey party had traversed the route since Lewis and Clark, and it was their journals that Stevens consulted.⁵²

His party was large and competent: 240 civilians, 11 Army officers, 76 Army enlisted men, scientists, and support personnel.⁵³ It was to march west, resupply at Fort Union, and rendezvous with the other parties at Fort Benton (modern Montana). Lieutenants Andrew Jackson Donelson and John Mullan were to go up the Missouri by steamer, establish a base at Fort Union and explore the surrounding countryside. On the western scarp of the Rockies, Lieutenant Rufus Saxton was to establish a camp and run a survey line east to meet Stevens.

On Puget Sound, Lieutenant George B. McClellan was to move up the Columbia, probe the Cascades, and link up with Saxton's lines. Naturalist George Suckley took a roving commission, traversed as much of the area as he could and collected an unrivaled closet of natural specimens. Drs. George Gibbs and Thomas Cooper marched with McClellan.⁵⁴

The parties ranged widely, looking into the Dakotas and Black Hills. Within the year their work would be supplemented by that of Lieutenant Gouverneur Kemble Warren. Lieutenant Mullan ranged the Musselshell and Yellowstone River Basins, missing Yellowstone Park, and risked his life in hostile Blackfeet country. Suckley took what must have been one of the great canoe trips—down the Columbia covering 1,049 miles in 59 days.⁵⁵

The Stevens survey moved through Gadotte's Pass and an alternate route. The party probably could have done better if

McClellan would have risked the winter snow of the Cascades. Stevens, a politician, desperately wanted a railroad to Puget Sound to vitalize the maritime trade to China. There was dissension among members of the expedition, and Suckley said Stevens' report bordered on puffery. Suckley preferred the South Pass route.⁵⁶ Much to Stevens' credit, he financed an expedition in 1855, examined more of the territory and proposed routes into Seattle and Fort Vancouver.⁵⁷ Stevens was a lightweight politician and the transcontinental railroad was a prize pursued by every heavyweight in the country.

Benton, trying desperately to use the surveys for his own Missouri ends, saw his plans crumble. He wanted the 38th parallel route from St. Louis west and went after it in two ways. He secured the appointment of Edward Fitzgerald Beale as Indian agent for California and Nevada and sent him and his publicist-relative, Gwin Harris Heap, to find the way. They did so in short order, they proclaimed in their report. Benton failed to secure Fremont's appointment as leader of Humphreys' party along the 38th, and Captain John W. Gunnison was given the task.⁵⁸

Gunnison had marched with Captain Howard Stansbury from Fort Leavenworth to the Great Salt Lake and back. The relatively unsung Stansbury greatly affected the Missouri Basin and the nation when he found a trail westward up Lodgepole Creek, a tributary of the South Platte, and the avenue Fremont was seeking in 1843. Lodgepole Creek would become the passage for the Overland Stage and Union Pacific Railroad.⁵⁹

Lieutenant Edward G. Beckwith served as Gunnison's second in command; Richard Kern, his topographer; Frederick Kreutzfeldt, who had been with Fremont in 1848, his botanist; Jacob Schiel, his geologist; and a Mormon, William Potter, his guide. Their objective was to learn if rails could penetrate the Sangre de Cristos, the San Luis Valley, and rise to the West over Cochetopa Pass.⁶⁰

In August of 1853, they marched out of Fort Leavenworth for the Platte Valley. They reached Fort Massachusetts in the San Juan Valley without a guide. Gunnison hurried to Taos, marking a military road on the way. There he hired literate, rich Antoine Leroux to guide him. Leroux brought his personal valet along.⁶¹ Gunnison had to get to the Grand and

Green Rivers through known but uncharted Cochetopa Pass. With difficulty he did and arrived in Ute country at the Gunnison River. There, Beckwith said the sandy soil was bad for a railroad. Utes the party encountered said hostile Indians were ahead.⁶²

Kreutzfeldt became morose and called Gunnison our "ass of a captain" as he prepared to accompany him and 10 others to examine Sevier Lake. After Gunnison and Leroux had quarreled, the latter left to guide another party; uncertainty and fear stalked the group. On October 20 as the fated dozen were eating breakfast at Sevier Lake, Paiutes struck and killed eight of the surveyors, including Schiel, Gunnison, and Potter.⁶³ Gunnison died believing he had accomplished four things: made a military road to Taos, found a new southern emigrant road, laid a military road to Utah, and proven the 38th parallel railroad route useless.⁶⁴

Beckwith took charge of the sad party and moved toward Salt Lake City. Simultaneously Fremont was moving along the 38th parallel route toward Cochetopa Pass, his fifth exploration of the West. He took Solomon Carvalho as his daguerreotypist, the first official photographer of any exploring party. Fremont's party, unofficial this time, was financed by Missouri interests to offset what they correctly thought would be a negative report by Gunnison.⁶⁵ Fremont's men made it over Cochetopa Pass and into new country, crossed central Utah, killed their animals for food, and almost starved.

On February 8, 1854, Fremont showed his mettle by guiding his men into the Mormon settlement of Parowan. Recuperating, they went to Cedar City, across the Escalante Desert, and into California south of Walker Pass. Fremont's notes, unpublished, and Carvalho's daguerrotypes, were destroyed some years later in a fire. If preserved, they would have been helpful to the Santa Fe Railroad, which followed a part of the route he explored.⁶⁶

In Washington, Humphreys viewed the proceedings with dismay as he watched his other explorations. Lieutenants Amiel W. Whipple and Joseph Ives moved along the 35th parallel through Cajon Pass and into Los Angeles on what was the most economical-to-build low-altitude route of the many proposed.⁶⁷ Lieutenants John Parke and John Pope, beginning West and East respectively, ran the 32nd parallel line to up-

date Emory's work. Pope left Fort Leavenworth and had to battle the *Llano Estacado*—the Staked Plain.⁶⁸ The San Joaquin surveys were conducted by three young engineers: Robert Williamson, John Parke, and Henry Abbott. All this happened while Beckwith was mulling over the whole experience in his Salt Lake City winter quarters.

With a flourish of simplicity, Beckwith asked for and got permission from Humphreys to continue his party's work, but along the 41st parallel. Beckwith made two jornadas across the Great Basin, as Fremont had done, and searched for William Warner's Madeline Pass through the Sierras. He found it and Noble's Pass as well and connected all of his work with Stansbury's Lodgepole Creek survey. Beckwith surveyed much of the route the Union Pacific would follow. It was the route which would finally make Omaha boom and create a hundred islands of settlement across the Missouri Basin and the American West.⁶⁹

Lieutenants Abbott and Warren worked with Humphreys in Washington to present the reports of the various surveys. When completed, their work totaled 13 magnificent volumes, remarkable and enduring accomplishments. They gave a comprehensive record of the Trans-Mississippi's fauna, flora, geology, and geography. With their four preliminary volumes, the set is still a treasure, the first relatively comprehensive look at the Missouri River Basin.⁷⁰

But nature could speak through no surveying engineer. She was constrained and unheeded in Congress by politics, sectionalism, and slavery. No ribbons of steel would unite the great oceans until after the Civil War. Areas in the Missouri Basin were still imperfectly known, and the thoughtful Warren was detailed to search into those places.

In August of 1854 Abbott, Humphreys, and Warren pored over reports of the railroad survey as Warren tried to piece together a reliable map of the West. Unknown to them, an Indian had stolen a cow from a party of Mormon emigrants near Fort Laramie. Such conduct could not be tolerated. Lieutenant John L. Grattan moved up the North Platte with 32 men and field pieces to properly punish the Miniconjou Sioux and Brule for the effrontery. Grattan demanded the perpetrator and waited, then opened fire. When the smoke cleared, the lieutenant and 31 of his men were dead, and a lone survivor was running toward Fort Laramie.⁷¹

Colonel William S. Harney was called upon to punish the Indians. Little was known of the Sioux and their hunting grounds, and he called upon the Topographical Corps for an engineer advisor.

Warren was given the duty; he left Washington in June of 1855, headed west. He studied Fremont and Stansbury's reports and quizzed St. Louis traders about the *terra incognita* before boarding a steamer for Fort Pierre. Warren was to make a survey of the dilapidated post for a military reservation before joining Harney at Fort Laramie. The lieutenant experienced a dreadful summer as his men dropped from heat stroke while helping with the survey.⁷²

Uncommonly intelligent, Warren had graduated second in his West Point class. His experience included surveying the Mississippi Delta under Humphreys, working on the Louisville and Portland Canal on the Ohio River, and dealing with Rock Island and the Des Moines Mississippi River rapids. The prairies were new to Warren,⁷³ but he did know what was missing from his maps. Nebraska Territory, the area which now comprises Nebraska, both Dakotas, and parts of Wyoming and Montana, was unknown. He must learn about Nebraska's Sandhills, the sacred Black Hills of the Sioux, the Loup, the Niobrara, and the Yellowstone Rivers. The newly passed Kansas-Nebraska Act encouraged other brave or foolish souls to set out for the interior from Sarpy's Bellevue.⁷⁴

His survey of Fort Pierre completed in early August, 1854, Warren chose to strike south across unknown country for the Platte to meet Harney. Six trappers, valuable for their knowledge, accompanied Warren's detachment. They crossed the Smoky Earth or White River and set a course for the Running Water River, so called by the Sioux (L'eau qui Court to the voyageurs; Niobrara to the Europeans). South of it Warren encountered the Sandhills, which he characterized as "exceedingly solitary, silent and desolate and depressing."⁷⁵

Such statements discouraged settlement of the area. For those who might come, Warren laid out a road and diligently marked the sites of wood, water, and grass. The march of two weeks took him to the Platte River and eventually Fort Laramie. Harney toasted him with champagne.⁷⁶

Shortly thereafter, Harney moved down the Platte with 600 infantry, cavalry, and artillerymen to punish the hostiles for



John Charles Fremont



Jessie Benton Fremont

Grattan's murder. On September 2 the troopers caught the miscreants near Ash Hollow. Unaware of what the Europeans call strategy, the Indians agreed to meet with Harney. When within range, Harney's troops opened fire, silenced Chief Little Thunder, and killed more than 80 of his people. Warren, standing on a promontory, attempted a topographical sketch of the battle but gave up and turned to tending the wounded women and children who were scattered about the field.⁷⁷

Sobered, Warren returned to Washington, added to his map, and published a report of his venture in the land of the Dacotah. He had the help of draughtsmen and a meteorologist, S. Hudson Snowden. In April he was back in St. Louis with Snowden, W. H. Hutton, a topographer, and Ferdinand V. Hayden ready to explore the Missouri River Basin again.⁷⁸ Hayden was to win fame and become a prominent 19th century scientist. The steamer *Genoa*, which carried the party toward Fort Pierre, ran aground at the mouth of the L'eau qui Court. Warren and his party walked the 160 miles to Fort Pierre. Freed, the *Genoa* arrived three days after Warren.⁷⁹

Harney welcomed Warren at Fort Pierre, introduced him to Indian chiefs, and permitted him to board the American

Fur Company steamer *St. Mary* bound for the upper Missouri. Seventeen men of the 2nd Infantry accompanied Warren and his surveyors beyond Fort Union. Along the way a true American hero, Jim Bridger, joined the party.⁸⁰ Bridger undertook to lead the engineers along the Powder and Yellowstone Rivers. A bullboat was built on the Missouri, and while the animals were driven along the shore, the party floated leisurely back to Fort Pierre and on to Sioux City, where a steamer was boarded.⁸¹

In Washington more cartographic work was done and it became obvious that travelers going West should stick to the Platte River route. The Upper Nebraska Territory was inhospitable to settlement and the Lewis and Clark and Stevens route to the Oregon country was unsatisfactory.

The third Warren expedition proved the most difficult. He planned to proceed up the Loup River from eastern Nebraska through the Sand Hills to Fort Laramie, and north into the Black Hills before returning. Trouble developed at the jumping-off point of Sioux City as 27 soldiers in the escort got drunk, and 12 troopers deserted.

The Platte and the Loup also proved difficult. The buzzing mosquitos of the upper Platte River tormented the explorers, and the Loup's quicksand mired their wagons. Warren found the Loup Valley impracticable for a road and almost totally useless. That it took a week with little water to cross the arid Sand Hills between the Loup, and the L'eau qui Court did not improve matters.⁸²

At Fort Laramie the party split, Snowden to examine the Niobrara and Warren to explore the Black Hills. The two-week layover at Fort Laramie was too much for Snowden, who had to contend with unruly and drunken troopers.⁸³

Making for the Black Hills, Warren conferred with the Hunkpapa chief, Bear's Rib. The chief knew a surveyed road would bring Europeans to his Black Hills. So did Warren, and he did not want to contribute change to the Indian way of life. He accepted the chief's invitation to leave the Black Hills. The party crossed what is now the Pine Ridge Reservation and camped at Wounded Knee, where a tragedy resulting from a clash of cultures would occur in 1890.⁸⁴

On his way down the Niobrara, Snowden also met an irate chief. He charged that Snowden's party was eating too many

plums and chokecherries, and his horses were eating too much grass. Game for 100 miles had been spooked away, he said. Exasperated, Snowden threatened to shoot the troublemaker, who soon recognized the explorer's wrath and withdrew.⁸⁵

Returning to Washington, Warren drew up yet another report. It recommended against trying to build a road up the Niobrara. Settlement would have to wait. He finally finished his map of the West, which showed what his fellow engineers had done based on every reconcilable scrap of evidence available. Warren was acclaimed for his map. His reports gained additional notice when published again in 1875. The year before gold had been discovered in the Black Hills. Warren's work served as a guide to invading gold miners. Within the year the reports served as guides to Warren's fellow officers as they began the great war against the Sioux.⁸⁶

One can ask: "What is the importance of these engineers? How did they affect the Missouri River Basin?" First, they brought an ordered scientific method to its examination. They found that in their time there were better alternatives to the basin's settlement. They found the high road over which the railroad allowed settlers to bypass the basin. The engineers examined, described, and mapped the basin. The soldier-explorers warned of the basin's dangers and shortcomings. They explained its beauties, riches, and desirability. They made the Missouri River known and gave some understanding of its character. And, they helped open a continent.

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