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TO

EXECUTIVE DOCUMENTS,

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1853–'54.

IN THIRTEEN VOLUMES.

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I.

SURVEY OF THE NORTHERNMOST ROUTE IN CHARGE OF GOVERNOR I. I. STEVENS.

A.

Summary of results of North Pacific railroad survey, reported by Governor Stevens to the Secretary of War.

WASHINGTON CITY, *January* 31, 1854.

Accompanying these reports is a map sketch on a scale of $\frac{1}{600000}$ of the operations and proposed road from St. Paul to the Shayenne river, and Governor Stevens is "confident no grade will be found of more than twenty feet per mile," and "cost without equipment will not exceed $20,000 per mile."

Another map sketch is given on a scale of $\frac{1}{1200000}$ from St. Paul to Fort Union. He says "the enclosed sketch of a railroad route certainly practicable at a cost not probably exceeding $40,000 per mile. * * * The great key points of the country are the valley of the Moose river and the region of the Bois de Sioux." No grade is mentioned, nor profiles given, of any portion of the route.

West of Fort Union no sketches of the country have been received. The rivers along the route are reported as being very much out of place on the maps, and indeed it is impossible to trace the route definitely upon the maps in this office. No astronomical positions are given.

The nature and substance of the results obtained west of Fort Union, so far as reported, are as follows:

At Fort Benton.—Governor Stevens says "up to this point we have found the country entirely practicable. Whichever pass in the mountains is decided upon, the Milk river valley will furnish a good approach."

At St. Mary's village.—He reports that two approaches to Cadot's pass were examined, both requiring a tunnel "not exceeding a mile in length," and a grade that will not "probably exceed forty or forty-five feet per mile."

To the west, "the descent down the Hellgate river was mostly through an open valley, till the Hellgate passage is reached, where the river winds in a narrow defile, requiring for a railroad expensive sustaining walls and embankments, and probably some small tunnels to avoid short curves." "It can be turned by tunnelling a marble mountain to the south of it, or by crossing over from a tributary of the Hellgate in the open valley of the pass to the valley of the river Jocko, one of the principal southern tributaries of Clarke's fork." This was explored and a barometer profile taken; "in the absence of it, can only state itwill probably furnish a practicable mode of avoiding the Hellgate defile."

Cadot's pass is reported as being "nearly 3,000 feet below the south pass," and "a much better one, both in summer and winter" A small party examined a pass in the Rocky mountains south of Cadot's

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pass, and one was fitted out to examine the Maria's pass to the north of it.

The Bitter Root range, west of St. Mary's valley, are said to be impracticable.

At Olympia, December 5.—Governor Stevens reports that a route was surveyed over the Cœur d'Eleine mountains from St. Mary's to Fort Colville, but no barometer profile taken for want of an instrument. "It is probable" these mountains might be passed with a tunnel not exceeding "six or perhaps four miles without involving impracticable grades." Difficulties from snow "should be carefully investigated."

Lieutenant Donelson surveyed the general line of Clarke's fork. Governor Stevens says he "reports the route from the debouche of the Hellgate pass to the banks of the Spokane" * * as "practicable, involving no other difficulties than are usually met with in the Atlantic States, and that it will connect well with a route through the Marias pass, should a practicable one be ascertained. The grass is generally good, there having been a scarcity only two nights."

The Columbia was explored from Fort Colville to the forty-ninth parallel. Captain McClellan explored the Cascade range as far north as the forty-ninth parallel, and his examinations were connected with the others under Governor Stevens.

Governor Stevens refers to Captain McClellan's examinations, and "I apprehend no difficulty whatever in the Sno-qual-me pass to the passage of a railroad; and from information I have received from old residents, particularly from Major Goldsborough, a civil engineer who has carefully examined the country, it will be an easy matter to carry it to a good harbor on the sound."

According to Captain McClellan's report of September 18, the Sno-qual-me pass "is at the head of the main Yakima," some thirty-five miles north of mount Reginer. The lowest point of the divide is 3,543 feet above Vancouver. The descent to the east to Lake Katchelas, a distance in a direct line of about three and one-fourth miles, is 1,129 feet; beyond this, "there is no difficulty in the construction of a road of any kind." He did not "proceed more than a few miles beyond the divide" to the west, but as far as he went, "the valley was narrow and the descent steep." He reports the Nah-ches pass as 4,966 feet above Vancouver, and not so favorable as the other. In both passes the snow accumulates in the narrow valleys, probably 20 feet, and in the mountains, five or six feet.

Owing to the lateness of the season, the survey was to be continued to Puget sound by the line of the Columbia and Coulitz.

Governor Stevens does not mention any grade as the probable maximum from the summit of Cadot's pass to Puget sound. The extent of country adapted to cultivation, and the facilities for wood and water, are not particularly alluded to. At the date of Governor Stevens' last communication, (December 5,) the finished drawings and estimates had not been made for any portion of the work. The explorations west of the Cascade range are not terminated. The reports of those sent to guage the snows had not been received, nor could they, and that of the party left to finish the survey of the Missouri river, and the one to run a line from St. Mary's to Fort Hall, be expected in before the first of March.

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UPPER MISSISSIPPI,
Steamer Nominee, May 27, 1853.

DEAR SIR: I have the honor respectfully to inform the department, that I left Washington city on the 9th instant, stopped in New York one day to transact business, and taking the route of Lake Erie and Chicago, reached St. Louis on the 15th. I remained in St. Louis until the departure of the fur company's boat on the 21st, which carried up ten thousand rations to Fort Union, and a small party, consisting of Lieutenant Donelson, Lieutenant Mullin, Mr Graham, and six sappers and miners. Lieutenant Donelson is instructed to make the best possible survey of the Missouri, and of the country in the vicinity of Fort Union, from the White Earth to the Porcupine rivers. Whilst at St. Louis, I secured the services of Alexander Culbertson, esq., as a special agent among the Blackfeet Indians. He has lived in the country twenty years, knows by name every adult male in each tribe. He estimates the number to be from fifteen hundred to eighteen hundred lodges. I found him to be a reliable, steadfast, calm man. He joins the main party at Fort Union, and accompanies us to Fort Benton. The fur company make the trip, 400 miles, in twenty days, four mules drawing 1,600 pounds. The grasses in the Blackfeet region are exceedingly good, the country is well watered, and wagons can be taken to the very base of the mountains.

The Blackfeet tribes know all the passes in the mountains, and Mr. Culbertson assures me that we shall have no difficulty in securing the confidence and controlling the Blackfeet. With vigilance and firmness, I entertain no apprehensions whatever.

Dr. John Evans, who is entrusted with the geological reconnaissance of Oregon, under the supervision of the General Land Office, for which Congress has made a special appropriation, has accepted the position of geologist of my expedition. He will, on his way to Oregon, go through the "Mauvais Terres," exploring the routes in that interesting region, connecting it with the Missouri by two lines, leading respectively to Fort Pierre and Fort Union, and making for my exploration collections of the highest value to geological science. The topographical information which he will collect will be a great assistance in enabling me to determine the best route for my return party. Dr. Evans will place at the disposal of the expedition all his topographical notes and barometrical observations crossing the mountains, and thus, at very small expense, the expedition will derive from his labors great aid in both its direct and incidental objects.

I shall reach St. Paul's this evening, where I expect to find all the arrangements well advanced to commence the exploration, and from which place I hope to start at the furthest by the first of June. I will communicate again with the department as I leave the settlements, and will at the same time enclose a statement of expenditures up to that point.

I enclose herewith, printed copies of the instructions given in each branch of the survey. As the party was quite numerous, and each member receives copies of them, in addition to specific instructions, I had them all printed, except the paper called "General Organization of

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the Expedition," as it was more economical than to be subjected to clerk hire for so great a labor.

I have the honor to be, very truly, your obedient servant,

ISAAC I. STEVENS.

Hon. JEFFERSON DAVIS,
Secretary of War.

Northern Pacific Railroad Expedition.

The special object of the exploration is the determination of a railroad route from the head waters of the Misssissippi river to Puget sound. In consequence of the meagreness of the information in reference to the country to be gone over, particularly in the Rocky and Cascade mountains, a general topographical survey must be had of these mountains between the 46th and 49th parallels, and of most of the intervening country, in order to determine the general course of the railroad and furnish the data to guide the civil engineers in determining the route. The operations involved are therefore as follows:

1st. *A general reconnaissance of the country.*—This reconnaissance will embrace the general features of the country, as mountain ranges and passes, windings of rivers and streams, their dividing ridges, prairies, and every thing which shall be necessary in the construction of a general map of the country passed over. The result of this examination, done by reconnoitering corps assigned to the special duty, will be to determine the most advantageous route to be pursued for the railroad, and to direct the movements of the party entrusted with locating it. It will be an important object in the general reconnaissance to determine, with all possible accuracy, the important features of the country, especially those which have a bearing upon the location and construction of the proposed railroad. Of this class are the important points of the Missouri and Columbia rivers, as the heads of steamboat and boat navigation; the debouches of the mountain passes, both of the Cascade and Rocky mountain ranges; and of such important points, the latitude and longitude should be determined either by the sextant and transit, or by the sextant and chronometer, as may be practicable. The observations of important objects by compass ranges should be referred either to those points whose geographical positions have been determined, or to the base line of the route.

Parties entrusted with reconnoissances and surveys will make topographical sketches of the country on the several routes pursued by them, and will, as far as practicable, be supplied with the necessary instruments for working with facility. In the lack of an odometer for measurement, such means must be made use of as are generally resorted to in similar cases, as measurement by the pace of a horse or a man, &c.

2d. *The survey and location of the railroad.* This will be along the route, resulting from the labors of the reconnoitering corps, and will embrace all the facts bearing upon the construction of the road; particular regard being had by the reconnoitering corps, and the corps entrusted

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with the location of the road, to the natural facilities for the transportation of iron, supplies, &c., which will be required for the road. Objects observed will be referred to the known points of the base line of the route, referred to hereafter. The route will be run by compass courses day by day, and measured by an odometer, and the results thus obtained, checked by the daily determination of latitude and longitude, will form the base line, to which will be referred all objects observed in the survey.

A general profile of the route will be determined by means of barometrical measurements. The altitudes of the halting places at night and noon, the tops of ridges and bottoms of valleys, and, so far as possible, the altitudes for the construction of a continuous profile, in connexion with the measurements by the odometer, will be obtained. In the crossing of rivers, the height of the banks must be noted, the depth of the water, the apparent highest water, the nature of the bottom on which the foundation for the abutments and piers must rest, the width between the banks, and all information determining the means and cost for carrying a road over the stream, should be obtained as fully as practicable. So, in smaller crossings of gullies and small streams, similar facts in reference to culverts should be obtained. In general, every thing in the character of the country passed over affecting the construction of a railroad will be noted, the estimated or determined grades, the nature of the excavation, facilities for obtaining stone, timber, and all building materials, &c., &c.

The positions of all objects noted on the route will be determined either directly by the odometer and compass, referred to the line of the route by compass bearing and estimated distance from one point, or simply sketched in, according to the importance of the object.

3d. The decisive points which must determine the location of the road are the mountain passes of the Cascade and Rocky mountain ranges; and it may occur that the location of the road between the two ranges, and for a long distance east of the Rocky mountains, must be suspended until these passes be examined and selected; and much of the general reconnoissance must be made after the selection of these mountain passes, which are the controlling points of the survey.

It is proposed to construct the following maps, embodying the geographical results of the exploration; and the efforts of reconnoitering and surveying parties will be especially directed to obtaining the best data for the construction of these maps:

A general map, scale $\frac{1}{2400000}$, from the head waters of the Mississippi river to the Pacific ocean, and from the 42d to the 56th parallel.

A map in two sheets, scale $\frac{1}{1200000}$ of Washington Territory, and thence eastward to the head waters of the Mississippi:

A map, scale $\frac{1}{400000}$, Cascade range, Rocky mountains, and other critical points of the route.

Mountain passes, scale $\frac{1}{80000}$.

Working sketches, scale $\frac{1}{40000}$.

The field books are constructed so as to be convenient for reduction to the scale of the several maps above. As ruled, in small squares of about $\frac{3}{8}$ inch side, each side represents $\frac{1}{4}$ of a statute mile, scale $\frac{1}{40000}$, and it is designed that this scale should be generally used in sketch-

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ing. Where necessary, however, to depart from it, the sketches should be of a scale $\frac{1}{5000}$, $\frac{1}{10000}$, $\frac{1}{80000}$, &c., the sides of the squares respectively representing $\frac{1}{32}$, $\frac{1}{16}$, $\frac{1}{2}$, statute mile, as shall be found necessary, the scale by which the sketch is made being marked on the page containing it. The direction of the magnetic meridian of the sketch (running longitudinally down the page, or taking the direction of the other sides of the square, as shall be most convenient at different times) will also be noted on each page, and the magnetic variation recorded in the field book with each day's work.

The work of the day will be made up in camp at night with ink, and will be transferred by the draughtsman to the general map, scale $\frac{1}{1200000}$.

General Organization of the Expedition.

1. The expedition is in charge of Isaac I. Stevens, governor of the Territory of Washington.

2. There will be two main parties in prosecuting the work. One party, under the immediate direction of Governor Stevens, will proceed from the Mississippi river, and surveying rapidly the intermediate country will reach as early as practicable the Rocky mountains, and examine all the passes to ascertain the most practicable one. The second party, under the command of Brevet Captain George B. McClellan, will organize at Puget's sound, or on the Columbia, and operate for a similar purpose in the Cascade range of mountains. The parties will operate in the mountains until they are thoroughly explored, or till driven away by the snow, when they will be applied, with probably a somewhat reduced organization, to the survey of the intermediate region.

To insure unity in the entire operation, Governor Stevens, as soon as the eastern party has been put to work on the Rocky mountains, will advance rapidly with a small reconnoitering force to meet Captain McClellan and arrange the entire operations.

For more full information as to the organization of the expedition and character of the survey, see the printed instructions of the Secretary of War.

3. All officers detailed on the survey are on topographical duty, and will in the field receive one dollar per day.

Lieutenant Rufus Saxton, junior, is the acting assistant quartermaster, and commissary of the expedition. His most important duty as such is, as early as practicable to cross the isthmus, and establish a depot of provisions at the Flathead village of St. Mary's, just west of the Rocky mountains, and then crossing the mountains by the Blackfoot trail, meet the eastern party at Fort Benton, at the sources of the Missouri River.

5. Till he joins the main party, *Lieutenant Cuvier Grover*, will act as commissary and quartermaster for the eastern party.

6. Under the instructions of the Secretary of War, the administrative branches of the service will bear all the expenses of the army portion

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of the expedition. The appropriation for the survey will be chargeable with the pay, subsistence and transportation of the civilians employed as a scientific corps and their assistants, with instruments and collections.

7. Each officer and scientific man of the expedition will keep a daily journal, noting everything worthy of observation of a general character. These journals will be deemed a part of the results of the expedition; will be turned over as a part of its archives, and will be made use of in preparing the report. This is not intended to preclude copies being taken and published by the writer, after the publication of the report and proceedings of the expedition.

8. Whilst every effort will be made to render the expedition in all its parts effective, the most rigid economy is enjoined. Transportation is not only expensive but cumbersome. Personal baggage must be reduced to the smallest practicable amount. Attendants and animals to be kept at a minimum. Great care must be taken in matters of account, particularly in the division of the expenses between the survey and administrative branches of the services.

9. The clerk and disbursing agent is *Isaac F. Osgood.* He will keep an account of books and instruments, taking receipts therefor, whenever practicable. They will be turned over to him when not wanted for further use.

10. Professor *Spencer F. Baird* is the naturalist of the expedition. The naturalists and collectors, for full information in reference to the duties, are referred to his printed notes prepared expressly for this expedition, and his printed directions prepared for the Smithsonian Institution. The collections will all be sent to him in Washington for the preparation of that portion of the report.

11. *Dr. John Evans* is the geologist of the expedition, and the geologists and collectors are referred to his printed paper for valuable suggestions in reference to that interesting and almost unexplored region in which the expedition will operate.

12. For instructions in reference to meteorological matters, see printed instructions.

13. For full information and instructions in reference to the topographical and railway survey, reference will be had to the printed instructions.

14. For magnetic and astronomical instructions, reference will be had to the written paper of the instructions.

15. Mr. Stanley is appointed the artist of the expedition. For valuable suggestions in connexion with this and other branches of the work, see a written paper prepared by him, which will serve as a basis of instructions.

16. Whilst great care will be taken to assign each man to his special and appropriate duty, all are desired to inform themselves in reference to the general objects and results of the expedition, and do all they can to forward the several special operations.

This is the more important, as parties will be frequently subdivided, and several duties thus be, of necessity, thrown upon the same individual.

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St. Louis, *May* 21, 1853.

My Dear Sir: If it would be a possible thing for you to prepare a brief popular notice of the "Mauvaises Terres," to go into my preliminary report, I shall be glad. That report I mean to send from Puget sound, about the 15th of December, and your notes I should want a month earlier.

I hope the artist will prove equal to his duties, and that with his assistance you will be able not only to make sketches of the bad lands, but a tolerable survey, which can be incorporated into our general map. You will easily connect it with the Missouri river by your two lines to Fort Pierre and Fort Union.

At Fort Union, should I leave before your arrival, I will leave word as to the two routes I shall take, with the probable time of being at Fort Benton.

I hope I shall not fail to meet you before you cross the mountains.

Truly yours,

ISAAC J. STEVENS.

Cannot you, in the form of a journal, have a notice which will answer as a preliminary notice; and I would suggest that if, at Fort Benton, you could let me have your journal, with all your sketches and topography, the artist and draughtsman of the expedition could at once prepare them, with other matter, for publication.

Mr. John Evans,
Geologist, St. Louis.

METEOROLOGICAL OBSERVATIONS.

PROGRAMME.

1. Permanent posts for one year, to be kept up for a longer period if additional appropriations are made.

2. Parties in the field to be continued six months; the permanent posts a result of their labor.

3. At permanent posts will be barometrical and hygrometrical observations; also, quantities of rain and snow will be carefully observed; also, observations as to wind and storms.

4. Parties in the field will all observe for temperature, wind, and storms. Some four, main parties, will use the barometer, and, if practicable, make observations as to rain and moisture. Aneroids to be used for detailed work.

Note.—The Aurora Borealis, temperature of hot springs, &c., will be carefully observed, both at posts and by field parties.

5. *Permanent posts.* 4. Main posts. 1. Puget sound. 2. Columbia barracks. 3. The Flathead village of St. Mary's. 4. Fort Benton, and three posts of second order. 5. Fort Colville or Okonogan. 6. Fort Wallah-wallah, and 7, the British trading post at the debouche of the Marias pass, and 5, winter posts. 8. In the Blackfoot trail. 9. In the Marias pass. 10. In the intermediate pass, and 11, 12, two passes in the Cascade range.

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