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REPORTS

OF

EXPLORATIONS AND SURVEYS,

TO

ASCERTAIN THE MOST PRACTICABLE AND ECONOMICAL ROUTE FOR A RAILROAD

FROM THE

MISSISSIPPI RIVER TO THE PACIFIC OCEAN.

MADE UNDER THE DIRECTION OF THE SECRETARY OF WAR, IN

1853-5,

ACCORDING TO ACTS OF CONGRESS OF MARCH 3, 1853, MAY 31, 1854, AND AUGUST 5, 1854.

VOLUME XII.

BOOK I.

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especially January and February, I made treaties with all the Indian tribes of the sound, and held councils with all the remaining Indians of the territory west of the Cascades, except those of the Cowlitz and Chehalis rivers, and thence to the mouth of the Columbia, which enabled me to get a large amount of information in regard to the character of the country, and especially of its capacity for settlement, for the question, Where shall the reservation be established? made this information an indispensable necessity in order to arrive at just and sound conclusions.

Whilst these operations were going on west of the Cascades, in the way of making treaties, Mr. Doty was moving among the tribes east of the Cascades, in order to make arrangements to hold councils with them. This took him to the Yakima country, into the Walla-Walla valley, and to the Nez Percés country, where we held councils with the various tribes, each in its own country, and where the arrangements under my instructions were made that all should assemble at their old council and peace ground in the Walla-Walla valley. The goods for this council were sent up the Columbia river in keel-boats, they having been wagoned to the mouth of the Des Chûtes, and thence taken up the river. This may be said to have been the commencement of the navigation of the upper Columbia with keel-boats; and so practicable is the Columbia in this respect that the main bulk of the supplies for the Walla-Walla post during the past two years have been taken on the line of the river in sailing vessels carrying from forty to sixty tons burden. No difficulty whatever has been found in running up in all the rapids, and the trip has been made from the mouth of the Des Chûtes to old Fort Walla-Walla in twenty-four hours.

About the middle of May, 1855, I started from Olympia, and moving rapidly to the Walla-Walla, joined Mr. Doty at Camp Stevens, on one of the tributaries of Mill creek, on the 21st day of May, 1855. The account of my subsequent explorations (which is simply a continuation of this exploration) I have denominated the narrative of my explorations in 1855; but this narrative I will conclude after some general remarks.

It did not seem advisable to the War Department to order a continuation of these surveys, nor have I ever complained that such continuation was not ordered and placed in my hands. It was unquestionable that a considerable sum had already been expended, and if the information which I had furnished was deemed decisive and controlling in favor of the question of railroad practicability, or if the due allotment of the appropriation had been assigned to the northern route, it was wise and just to apply the subsequent appropriations to points where the question was still doubtful, or which had not received their proper share of attention. I only regretted that, as it was admitted that the question of the snows of the Snoqualmoo Pass could only be settled by actual admeasurement, a winter post at that pass was not established in order to procure reliable information. When the time comes for building the railroad over this northern route, the engineers will then make this examination if they are not satisfied that the snow is not an obstruction. They will make the instrumental survey of the Snoqualmoo Pass to the sound, because it is a question of the saving of some 130 miles over the route by the Columbia and the Cowlitz. If we look to how railroads have progressed in this country, particularly to the earlier roads; if we look to present projects now being carried into successful execution, we shall be convinced of the truth of this observation. On some of the old lines of railroads, simply to improve grades a little and to get a better location for depots, the old track has been replaced by a new one, sometimes for one-quarter of the whole length of the road; in some cases there not being an interval of a mile between the two tracks at any point. This is the case with the Boston and Maine railroad. But when grades are eighty feet and more,

engineers and business men have deemed it expedient to open other lines where the grade could be reduced, even if it involved costly and excessive tunneling. This is the case in Massachusetts. The Great Western railroad of that State, coursing along its southern border, and having its terminus at Albany, has grades of eighty feet or more; and now along the northern border of the State they are tunneling the Hoosac mountain as long, probably, as any tunnel on the northern route, in order to get the grade down to sixty feet, and to open another connexion between the waters of the Hudson and those of Massachusetts bay, at a saving of distance of only forty miles. These instances might be multiplied almost indefinitely, and they show precisely what our people will do when they come upon the work of our great overland communications.

I had taken, however, the precaution to order from New York some barometers, and to get suitable supplies of drawing materials and stationery, with the view, as I reported to the department, of availing myself of every mode to gain a knowledge of the country.

And in submitting the following report of my explorations of 1855 it is but justice to myself to say that the whole of it was done without any pecuniary assistance whatever, except the payment of the purchase referred to. It was done and with great personal exertion, as extra duty by myself and the two gentlemen with me, without causing the delay of the train for a single moment or the hiring of a single additional man. And thus did I gain facts which tended to verify the accuracy of the general results in the way of altitude in 1853; for I happened to have in my possession the copy of the preliminary computations for altitude, as derived from the barometrical observations; had it not been for this, I would not have my data even for publication in regard to profile. The profile itself was drawn in Olympia previous to my departure.

It will also be observed that Mr. G. W. Stevens, who had brought the portable transit through on the backs of animals from Fort Benton in 1853, had a little observatory made at Olympia, where he determined the latitude of that point. This young gentleman was of great promise, but to the affliction of all his friends he was drowned in the Skookum-Chuck in February of this year. He was my private secretary, and I had been exceedingly anxious that he should have an opportunity of resuming employment on the survey, and of going over the country to determine carefully the geographical positions. From causes already adverted to, our results for longitude were not reliable.

I had forgotten to mention, in the proper place, that Lieutenant Arnold, who, under my general supervision, had relieved Captain McClellan from the charge of the military road from Fort Steilacoom to Fort Walla-Walla, executed the duty greatly to the satisfaction of the people and of the emigrants who went over the road, as well as to the satisfaction of the department. From his report to the War Department I give the following brief abstract and itinerary of his route.

#### LIEUTENANT ARNOLD'S LABORS.

In 1854 and 1855 Lieutenant Arnold completed the military road across the mountains by the Naches pass, which had been commenced by the citizens of the Territory, and by Captain McClellan's party in 1853. He thus reports on the nature of the country as it appeared to him in early summer :

Leaving Steilacoom, on the shores of the sound, the road crosses a tract of open prairies about ten miles in length, and nine in width, a part of what is known as the Nisqually plains. These plains are interspersed with beautiful lakes and scattered groves of timber, mostly oak and fir, the former of which must be of great value for ship building and other purposes at

some future period. The soil throughout is generally gravelly, except along the borders of the creeks, where it is black loam, the best proof of the richness of which is that every acre is settled upon.

From the plains it passes through thick timber for six miles to a high ridge bordering the valley of Puyallup river, which forms the limit of the gravelly district. This valley is from two to four miles wide, lying, like those of the Nisqually and Whitewater, between high perpendicular bluffs, and covered with a heavy growth of timber, consisting of arbor-vitæ and spruce, and with thick underbrush, chiefly willow and vine maple.

The soil is rich but somewhat sandy; above the crossing the stream forks, and is made up of many tributaries, along the banks of which large prairies are found, capable of a great yield to the agriculturist with little labor.

The Puyallup, fordable except at the highest stage of water, is generally about one hundred feet wide, and two and a half feet deep at the ford.

Leaving this bottom, the road passes alternately through small prairies and timber to Whitewater or S'kamish river. This stream is a perfect torrent, fordable only three months in the year, and even then the force of the current and exceedingly rocky bed renders the transit with the pack animals and wagons both difficult and dangerous, particularly for emigrant stock that have crossed the plains and Rocky mountains.

One of the most striking peculiarities of this stream is the milky color of the water, due probably to some earthy substance found along the northeastern side of Mount Rainier. Beyond this crossing lies a succession of fine prairies for seven miles, after which there is no grazing to near the summit of the mountains.

The soil bordering the river, including the prairies, is wet, though elevated, consisting of a mixture of clay and vegetable mould, which retains the moisture of the winter rains until near midsummer. With this exception, few sections offer greater inducements to the settler, and none surpass it in fertility.

From the last prairie the road passes over a high hill, very appropriately called Mud mountain, the soil being similar to that of the prairies. A thorough examination of this mountain was made, but high perpendicular bluffs running to the river, and a complete network of fallen timber, left no choice but to follow the location of the previous year. The greater part of this tract was made passable by a series of heavy cedar bridges. Descending again to the river, the road continues up the valley, making six crossings, which cannot be avoided except by heavy side cutting, and in many cases blasting; but in the event of another appropriation he strongly recommends that they be avoided.

Leaving Whitewater the road enters Green River valley, and, with the exception of a short distance where there are cañons, continues through it to the mountain. This deviation involves two hills, the highest fifteen hundred feet. Here, as well as along Whitewater, he says he should have made more improvements but for the important obstacles still to be encountered. The appearance of this valley is like that of Whitewater, but in approaching the mountains the ranges rose higher and gradually closed in, forming near its head a continuous cañon, and necessarily involving seventeen crossings. The river has an average width of forty feet, with a gentle current, and the bottom generally rocky. It can be forded whenever the road is passable.

Near the junction of Whitewater and Green rivers there is a remarkable peak called La Tête, from a large rock on its slope resembling the head and neck of a man. This is an important point, as it forms the gate of the mountains on the west.

Four miles beyond the only prairie above the forks is found, and would afford some grass for passing droves but for the numerous bands of Indian horses constantly crossing here. He strongly recommends sowing two or three hundred acres here with grass seed, as the woods around were burnt off many years since.

With the exception of the trails mentioned, the entire valleys and surrounding heights are studded with a dense growth of timber, mostly fir and spruce, with some hemlock, and now and then a pine, and the ground is covered with fallen trees, from four to six feet in diameter, and from one to three hundred feet in length. In many instances he noticed thrifty trees, three or four feet through, growing upon others much larger, which had fallen, and which, upon inspection, proved perfectly sound. This will give some idea of the amount of labor expected throughout this distance.

The ascent from the valley to the mountains was originally an unbroken slope of thirty-three degrees, and probably one of the most difficult in the country. This he reduced to a practical grade. Other steep slopes followed, many of which were graded, but the amount of money at his command did not allow him to do as much as he wished.

On the summit the mountains spread out towards the south, forming an extensive flat, filled with ponds, interspersed with prairies, and in other places covered with a dense but small growth of timber. The road skirts four prairies in the distance of two miles, which afford excellent grazing and an abundance of fine spring water.

Under the most favorable circumstances this part of the route will not be passable for wagon trains more than five months in the year. On his first reconnoissance (about the 28th of May) he found four feet of snow for five miles, and in many places from six to ten feet. On his return, after the completion of the work, the last of October, he found from one foot to eighteen inches of snow along the summit, thus showing that the interval was within five months for that year.

In crossing, about September 12, in 1853, Lieutenant Hodges encountered a slight fall of snow, but it did not remain, for emigrants, crossing several weeks later, found none in the pass, and none fell until the third of November, and then only to the depth of four inches.

Near the dividing ridge is situated Mount Ikes, about 5,100 feet above the sea, from whose summit he obtained a magnificent view of the surrounding country, extending beyond the sound to the west, and on the other sides limited by the mountains and their spurs.

To the south Mount Rainier appeared in all its majesty at a distance of fifteen miles, and towering far above him; to the east was the valley of the Nachess; to the north, the serrated volcanic (?) range near the Yakima Pass, and the beautiful ridge bordering that river on the north.

The eastern slope of the mountains was very favorable, and required comparatively little work. Descending from the mountains, the road crossed Nachess river, a beautiful stream, about twenty feet wide at the ford, having a gentle current and rocky bed, and entered a most picturesque valley. High ranges, in some places forming steep, perpendicular cliffs not less than 2,000 feet high; in others, graceful slopes covered with a luxuriant growth of bunch grass and thrifty timber; rapid mountain streams, forming at their mouths islands covered with groves; and the numerous rivulets traversing the prairies that border the river, make the scenery particularly striking when compared with the cold and dismal forests of the western valleys.

Vegetation matures much sooner on the east than on the west side, showing that the snows must melt much sooner.

The road crosses and recrosses that stream forty-four times; then crosses a ridge to the valley of the Wenass, with an ascent of about 800 feet; but from Captain McClellan's observations this might be avoided by following down the valley of the Naches to its mouth. Four miles below the Wenass is the first ford of the Yakima, which, during the travelling season, is there about one hundred yards wide, and not over eighteen inches deep in mid-summer.

From this ford to the bend of the Yakima there is barely a sufficient supply of water along the road, except at stated camps, and at them it is disagreeable and injurious, being strongly impregnated with sulphur.

Fuel for cooking purposes is also very scarce, but there is abundant grazing. Near the mouth of the Yakima is an excellent point for a recruiting camp for emigrants coming from the east. The remainder of the route to Walla-Walla is over the level sandy bottom bordering the Columbia for seventeen miles.

Lieutenant Arnold urgently recommends that an additional appropriation of ten thousand dollars should be made, which will give the work a permanence and stability that it justly demands.

*Distances measured by the odometer on the military road from Walla-Walla to Steilacoom, constructed by Lieutenant Richard Arnold, 1st lieutenant 3d artillery, United States army.*

	From point to point.	From Steilacoom, eastward.
	<i>Miles.</i>	<i>Miles.</i>
To Puyallup river .....	22½	22½
To first crossing of Whitewater.....	9½	31½
To last prairie on Whitewater.....	6½	38
To second crossing of Whitewater.....	11⅞	49⅞
To sixth crossing of Whitewater .....	5⅝	55½
To La Tête.....	3¾	59¼
To first crossing of Green river .....	1⅞	61¼
To Bare prairie .....	2⅝	63½
To western base of mountains.....	10¼	73¾
To first prairie on the summit.....	3⅝	77⅞
To last prairie on the summit .....	2⅞	79¼
To first crossing of Naches river.....	5½	84¾
To crossing of Papat valley .....	10½	95¼
To mouth of Bumping river.....	4¼	99½
To last crossing of Naches river.....	11¾	111¼
To Wenass river.....	10	121¼
To turn off from Wenass valley.....	16	137½
To first crossing of Yakima .....	4	141¼
To water in crossing bend of Yakima.....	18¼	159½
To 2d water in crossing bend of Yakima.....	7½	167
To Brackish spring, (undrinkable).....	16¾	183¾
To Yakima, below bend.....	18¼	202
To Yakima, near mouth.....	15¼	217¼
To end of road, opposite Walla-Walla.....	17¼	234¼

There is a foot trail leading from the head of Lake Kitchelus to the head of the Snoqualmoo, forming the true Snoqualmoo Pass. The Indians represent this as practicable on foot with the greatest difficulty, and that it is seldom used. In Mr. Tinkham's winter examination, the Indians who accompanied him reported this pass to be better and more free from snow than the Yakima Pass, but more obstructed by fallen timber, and therefore impracticable with horses.

About May 15, 1856, Captain Smalley crossed this pass and found snow only for two or three miles—the greatest depth being four feet.

On June 20, 1856, Major Van Bokkelen went up Snoqualmoo river from the falls, 35 miles, passing through prairie for five and a half miles, and the rest through forest greatly obstructed with timber. After passing the summit he lost the old Indian trail, and going for ten miles southerly by compass found another, and four miles further reached Lake Kitchelus. As this trail ended at the lake, he was obliged to force his way along its western shore for eight miles over rocks and timber, and at its lower end reached the foot of the Yakima Pass. The Indian trail passes around the east side of the lake. The whole ascent of the west slope is by a gradual rise.

Some of the country on the western slopes of the Cascade mountains has already been described in the account of the routes across the Klikitat and Snoqualmoo Passes. This description will apply to all that lying among their western spurs, as far as at present explored. Since the period of the expedition the surveys of the Land Office, and reconnoissances by various parties of the Washington Territory volunteers and others, have given to these districts even a more favorable character than might have been expected. Though the greater portion of the mountain spurs are covered with a dense forest of gigantic growth, there are along all the rivers, and at conveniently short intervals, prairies varying in extent from one to ten square miles, with the most productive soil, and offering to the pioneer farms already made to his hand. They must thus serve as a nucleus for the commencement of settlements, and can support a very numerous population until its increase and the gradual consumption of timber requires the cultivation of the equally rich forest lands. Many, indeed, have already preferred to clear lands in the forest, and found it more profitable than to occupy prairies at some distance.

Descending to the valley bordering Puget Sound, the Nisqually, Upper Chehalis, and Cowlitz rivers, we come to a vast extent of nearly level country, in which prairies are much more numerous and extensive, and where also the wooded bottom lands and often the uplands are all cultivable and valuable. This tract has a length, north and south, of 250 miles on the meridian of Vancouver; and allowing it only thirty miles of width, in order to allow for the water surface of the sound and for occasional mountains, we have an area between the Cascade and Coast mountains alone of 7,500 square miles, or 4,800,000 acres. This constitutes the valley of the Territory, and is continuous with the famed Willamette valley, of Oregon, which it quite equals or exceeds in productiveness. One-third of this may be estimated as prairie, though much remains to be explored.

Forming an outlet to this on the west is the Chehalis valley, fifty miles long, passing through the coast range and continuing in a width averaging fifteen miles—480,000 acres. In the Willopah valley there are about 103,680 acres, and as much more level land along the coast, making, exclusive of the Columbia valley, 5,487,360 acres of level land between the Cascades and the ocean.

The Columbia, below the Cowlitz, presents to the traveller the appearance of having much less valley than it really possesses. High mountains of the Coast range rise very near its banks,