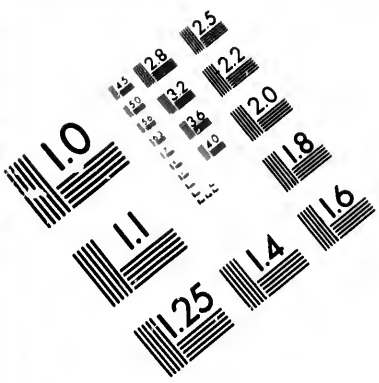

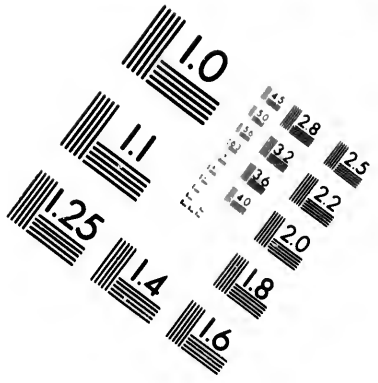

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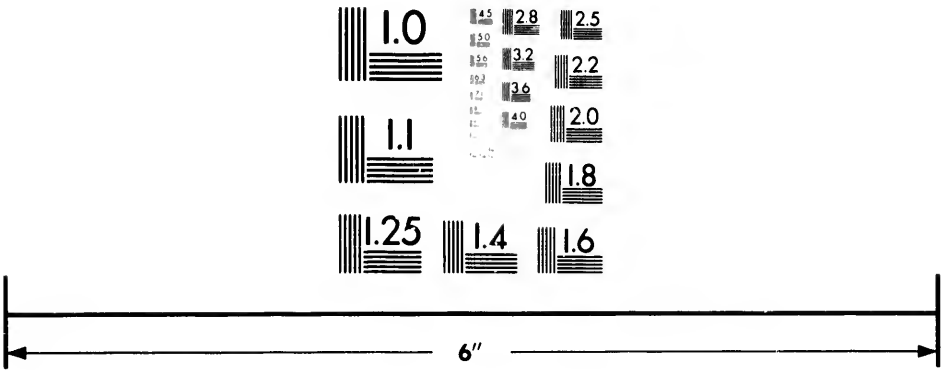

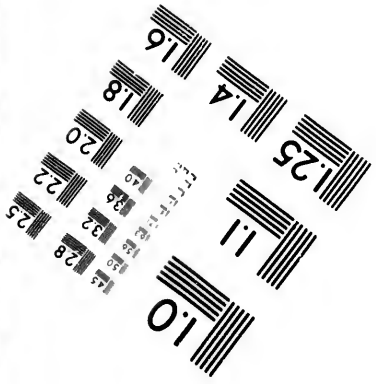

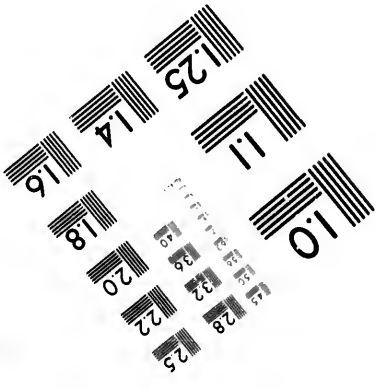

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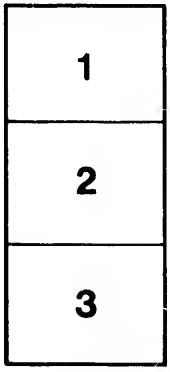

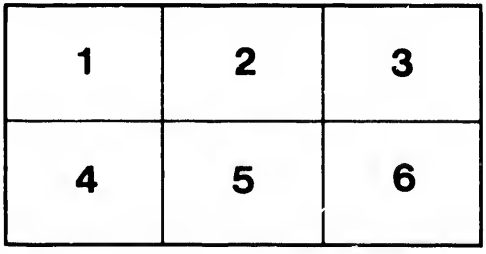

WILKESON'S

NOTES

ON

PUGET SOUND.

BEING EXTRACTS FROM NOTES BY SAMUEL WILKESON ON A RECONNOISSANCE OF THE PROPOSED ROUTE OF THE NORTHERN PACIFIC RAILROAD MADE IN THE SUMMER OF 1869.

Abridged.

PUGET SOUND.

DEPTH OF WATER—HARBORS.

I BROUGHT to this archipelago of harbors an extraordinary measure of the depth of the water and the security of the anchorage. A Sag Harbor whaler had said to me: "A seventy-four gun ship can lie pretty "much all over the sound, with her jib-boom among the trees on shore, "six fathoms under her bows, and twenty fathoms under her stern." And I had read in Lennard of the depth of the channel separating the island of Vancouver from the main land, which channel in all its external characteristics and features strictly resembles the entire body of water called Puget Sound in the charter of the Northern Pacific Railroad. He says: "As might be supposed in a sea of this description, the results "obtained by sounding are very various; but the reader will probably "hardly be prepared to hear that the extraordinary depth of seventy or "eighty fathoms is frequently met with, and this, in many cases, under "the very shadow of the rocky coast of the island itself. I remember, "on one occasion, a sounding, taken at our bow, gave a depth of eight "fathoms, while one at our stern gave fifteen;" [the measurements were taken off the deck of a little yacht of twenty tons;] "and on another "occasion we obtained eight fathoms and sixty fathoms as the result of "two successive throws of our line."

Commodore Wilkes, on his exploring expedition, went into the sound with his two ships, and was piloted by the first officer of the Hudson Bay Company's steamer nearly down to the southern end of it, opposite Fort Nisqually, where he cast anchor. He says of the sound in his History: "Nothing can exceed the beauty of these waters and their safety. Not "a shoal exists within the Straits of Juan de Fuca, Admiralty Inlet, "Puget Sound, or Hood's Canal, that can in any way interrupt their "navigation by a seventy-four gun ship. I venture nothing in saying "that there is no country in the world possessing waters equal to these. "The anchorage off Nisqually is very contracted, in consequence of the "rapid shelving of the bank that soon drops off into deep water. The "shore rises abruptly to a height of about two hundred feet, and on the

"top of the ascent is an extended plain covered with pine, oak, and ash "trees, scattered here and there so as to form a park-like scene."

Governor Stevens, of Washington Territory, who was assigned by the Government, in 1853, to the duty of exploring a route for a Pacific Railroad from St. Paul to Puget Sound, thus describes this marvelous body of water: "On the whole west coast from San Diego to the north, no- "thing like this is met. All the water-channels of which Admiralty Inlet "is composed are comparatively narrow and long. They have all, more "or less, bold shores, and are throughout very deep and abrupt, so much "so that in many places *a ship's side will strike the shore before the keel "will touch the ground.* Even in the interior and most hidden parts, "depths of fifty and one hundred fathoms occur as broad as De Fuca "Strait itself. Vancouver found sixty fathoms near the Vashon Island "within a cable length of the shore, and in Possession Sound he found "no soundings with a line of one hundred and ten fathoms. Our "modern, more extensive soundings prove that this depth diminishes "toward the extremities of the inlets and basins. Nothing can exceed "the beauty and safety of these waters for navigation. Not a shoal "exists within them; not a hidden rock; *no sudden overfalls of the "water or the air;* no such strong flaws of the wind as in other narrow "waters, for instance, as in those of Magellan's Strait. And there are "in this region so many excellent and most secure ports that the com- "mercial marine of the Pacific Ocean may be here easily accommodated."

That is an understatement. The war and merchant ships of the world could be received and sheltered in this unequaled archipelago of harbors. Port Townshend is a harbor six miles long, with regular soundings of from one hundred and four fathoms to twenty fathoms, and good holding-ground all over. Dwamish Bay is six miles long, two and a half miles wide, and has a depth of from eighty fathoms to thirty. Port Susan is ten miles long, three and a half wide, and good-holding ground in from forty to fifty fathoms. Port Discovery is six miles long, and two and a half wide, with regular soundings of from thirty to thirty-five fathoms in mid-channel, and ten fathoms close to the shore. It is covered by a little high island called "Protection," which is two miles from the entrance to the harbor, and which locks out all winds. Washington Harbor, likewise protected against all winds, has a depth of from twenty fathoms to nine, right in shore. But both time and space fail to catalogue the ports on Puget Sound with their soundings. The survey of these waters by our Government has been thorough, and a study of the charts of the sound issued by the Coast Survey Bureau will simply

astonish people whose impressions of the depth of the anchorage and of the harbors have been derived from their experience of either coast of the Atlantic. The shallowest portion of this wonderful Archipelago is Bellingham Bay; yet the soundings at its entrance are from thirty to twenty fathoms, and the regular decrease to the shore, east, south and north, is from sixteen fathoms to three.

I note for Atlantic slope people a strange fact connected with these wonderful waters, and not without present and prospective value. The average rise and fall of the tide is about twelve feet in summer and fourteen feet in winter. But the tides here differ from those of every other part of the world. During summer, it is low water nearly all day and high water all night. In the winter, this is reversed, it being high water all day and low water all night. But the relation of the tides to the full and change of the moon maintains here as elsewhere. It is always high water at six o'clock at those periods, the highest tides being at six P. M. in summer and at six A. M. in winter.

Governor Stevens, who lived on Puget Sound, likened it to a tree with a very recognizable body called Admiralty Inlet, and innumerable side branches. The trunk of this tree of harbors ebbs and flows in a directly north and south line over more than an entire degree of latitude. The trunk and its branches together fill a region seventy nautical miles in length from north to south, and thirty miles in breadth from east to west. The country in which this body of profound water nestles in nooks and coves, and flows in vast canals, is a wide valley, bounded on the west by the Olympian chain of mountains and on the east by the Cascades. From every part of the sound the snow-covered peaks of both ranges can be seen at once. The distance between these crests of frosted silver, shining eternal above the evergreen of the cedars and firs which crowd the mountain-sides and valleys, and above the blue of the waters of the sound, is one hundred miles. The space between the range is of moderate elevation and presents a quite level depression. The higher spurs of the two mountain chains nowhere come to the water's edge, except at some points along Hood's Canal, which is the western branch of Puget Sound. The shore-lands in the immediate neighborhood of all the channels are, therefore, only hills, in part splendidly wooded, in part covered with luxuriant grass.

The gateway to this Puget Sound is called the Straits of Juan de Fuca. It is eighty miles long from east to west. For half the way of its length it is eleven miles wide. For the residue of the distance its width is twenty miles.

For the first half of the distance inward the north and south shores of the strait are parallel. The latter half branches out into broad and deep passages, bays, and channels.

Throughout, the strait is very deep. In mid-channel it has an average depth of one hundred fathoms, which is carried near shore on both sides. This extraordinary depth of water is maintained in all the channels and branches of the strait. Hood's Canal, for example, which is forty miles long and from one to two miles wide, has a "channel" depth of from fifty to sixty fathoms. Where it does shoal it performs the operation in water from thirty fathoms to five fathoms deep. The southern half of the Canal de Haro has from sixty to one hundred fathoms, while the northerly half, according to Stevens, "shows the more moderate sound-"ings of from thirty to forty fathoms." The depth over the Sandy Hook entrance to the harbor of New York is twenty-one feet in the South channel, and twenty-two feet in the Gedney channel, at low water.

This tree of deep and secure harbors, whose trunk, Admiralty Inlet, is forty-six miles broad and forty miles long. surprised its Spanish, American, and British explorers with suddenly-discovered little harbors, like hidden fruit among thick leaves, pendent from bays and attached to canals—quiet, lovely nooks, embosomed in green woods, and so deep that squadrons of frigates could safely anchor there—so deep that the work at the windlass of lifting a ship's holding-tackle makes all English-speaking sailors swear, and all Spaniards invoke those saints who hold in guardianship imperiled or lazy seamen. So secreted by fanciful nature were these harbors of harbors—or so hidden by the mother-harbors were these baby-ports—so snugged away were they and tucked up, with overhanging hills of foliage, with coverings of forest timber, and with narrow entrances whose uniformity of height and of leafy covering showed to the ordinary observer continuity of barrier, that Vancouver passed many by without seeing them, and the Spaniards did not find them, nor did the sharp eyes in the Yankee heads, Wilkes was captain over, detect them. But the lumbermen on the sound have found them—they, and the officers of the Coast Survey Service. And they are the loveliest bits of creation. One stands entranced on the deck of a vessel within their circles. Would that I had the wealth to covenant with man never to bring into these paradises of harbors the axe! The ideal sacrilege of chopping through the Garden of Eden to feed a saw-mill is realized daily here by the remorseless Americans who feed the hungry gangs of the Sound mills with the king tree and the queen trees of the world.

THE TIMBER OF PUGET SOUND.

Oh! what timber. On the Atlantic slope, where it was my misfortune to be born, and where for fifty-two years I have been cheated by circumstances out of a sight of the real America, there are no woods. East of the Rocky Mountains trees are brush. They may do for brooms; pieces of ships are got out of them, and splinters for houses. But the utmost throe of the Atlantic-slope soil and climate could not in ages produce a continuous plank which would reach from stem to stern of a thousand-ton clipper-ship. Puget Sound, anywhere and everywhere, will give you for the cutting, if you are equal to such a crime with an axe, trees that will lie straight on the ground, and cover two hundred and fifty feet of length and measure twenty-five feet around, above two men's heights from the ground (they are cut from stagings), and that will yield one hundred and fifty lineal feet of clear, solid wood below the branches. They are monarchs, to whom all worshipful men inevitably lift their hats. To see one fall under blows of steel or under the embrace of fire is to experience a pang of sorrow.

Out of deference to the human inclination to record testimony, I will show this timber of Puget Sound to my countrymen, and to those Europeans who are to be invited to become the Northern Pacific Railroad Company's fellow-citizens, through an official report. I will premise that the British, French, Spanish, Dutch, and Sardinian Governments are supplied on contract with masts and spars by a company which has erected sawmills at the head of the Alberni Canal in Barclay Sound. It is the Douglas Pine or Yellow Fir, commonly called by lumbermen the Oregon Red Pine, which is sent across two oceans to Europe as the very best material of the kind on earth. It was upon the wood of this tree, the commonest and most abundant on the northwest coast, tested by order of the French Government in the dock-yard at Toulon, that the following Report was made:

"THE FLEXIBILITY, RESISTANCE, AND DENSITY OF MASTS FROM "VANCOUVER ISLAND COMPARED WITH MASTS FROM RIGA.

"The principal quality of these woods is a flexibility and a tenacity of "fibre rarely met with in trees so aged; they may be bent and twisted "several times in contrary directions without breaking. Several of the "greatest length, having the ends at the foot and the top of the tree cut

"off, were tried comparatively with poles of the same dimension, cut "from a Riga spar of first-class, and the following results were found :

	Vancouver Pine.	Riga Pine.
"Maximum degree of bending "before rupture at the foot,	0 *m* 025	0 *m* 028
"At the head, . . .	0 019	0 016
"Mean, . . .	0 022	0 022
"Charge of rupture (per centi- "metres) squared at foot,	23 *k* 75	21 *k* 00
"At the head, . . .	16 11	19 68
	19 93	20 23
"Density of the wood at the "foot of the tree, . .	0 636	0 726
"Density at the head, . .	0 478	0 532
	0 557	0 629

"These experiments give a mean almost identical for the bending and "breaking of the two kinds of wood, while the density differs notably to "the advantage of the Vancouver wood.

"The only question still undecided is that of durability. The masts "and spars of Vancouver are woods rare and exceptional for dimensions "and superior qualities, strength, lightness, absence of knots, and other "grave vices.

"(Signed) L. A. Silvestre Du Perron,
"Chief Engineer of the Third Section.

"Toulon, September 21, 1860."

The question of durability suggested by this French engineer can be settled in a way to make a new revelation to ship-builders. A report on the subject of "Ship-building on the Pacific Coast," made to the Board of Marine Underwriters in San Francisco, December 16, 1867, by the Secretary and the Surveyor of the Board, says :

"These trees [Red and Yellow Fir], which constitute about one-half of "the dense growth of timber of Oregon and Washington Territory, have "become celebrated throughout the world for their magnificent propor- "tions, and the serviceable quality of the spars and lumber supplied from

"them. They frequently furnish sticks 150 feet long, 18 by 18 and even "24 by 24 inches square, without a particle of sap, without a rent or "check, perfectly sound and straight. Planks of this timber, 60 feet and "90 feet long, are readily obtainable, thus avoiding the necessity for "more than one-third to one-half as many butts or scarphs in a ship's "sides, decks, or fore-and-aft timbers, as are required in Eastern or Euro-"pean vessels. As to the strength of these woods, many mechanics think "it fully equal to that of Eastern white oak: and they all agree that, if "oak be stronger, nothing is easier than to use enough more of the fir to "make up the difference in the strength. In some respects, the fir has "the advantage over oak. It contains just enough pitch to enable it to "hold iron fastenings with a tenacity so great that bolts and spikes will "generally break before they will draw out of it. Iron never becomes "'sick' when imbedded in it, as it does when corroded by the acid which "saturates all kinds of oak. As to its durability, we know that, although "it has not yet been tested as the sole material of a guano or pepper "ship, yet it has been extensively used for new timbers, planking, ceiling. "decks, keelsons, and stancheons in large vessels repaired on the coast, "It has been the sole material used in building our coasting and river "schooners. It has built the *Chrysopolis*, *Yosemite*, *Capital*, *Geo. S.* "*Wright*, *John T. Wright*, and many other river steamers. It has been "used in doubling and rebuilding all the old ocean steamers on this coast, "and we have never yet met a ship-master or a ship-carpenter who, "during our fifteen years of this kind of experience, has complained of its "want of durability.

"The Yellow Cedar is undoubtedly the most valuable of all our trees "for ship-building. It is found in great quantities at Coos Bay, thence "along the coast of Oregon to Port Orford; also on the islands and main "land of Alaska. The Indians of the latter territory have for ages used "its trunk for their canoes. A vessel built of it at Sitka, thirty years "ago, was recently examined, five years after she was wrecked, by the "officers of the Revenue steamer *Lincoln*. The timbers appeared as sound "and perfect as on the day she was launched. This cedar is much finer "grained, handsomer, more dense, and a better timber in all respects than "any other cedar known. It grows to a height of 175 feet, with a diam-"eter of 4 feet. It is probably the finest material for docks in the world. "At Coos Bay, Mr. A. M. Simpson informs us, there are inexhaustible "quantities of this cedar, which has been used to some extent in the con-"struction of the bark *Melancthon*. After fifteen years' use in the frame "of his saw-mill, it shows no signs of decay. Mr. Simpson expresses the "confident opinion that heart cedar, cut from the lower part of this tree, "will outlast teak in *any part* of a ship's frame."

South of Olympia, members of the Northern Pacific Railroad reconnoitering party (which included the writer hereof) saw a spruce tree feet high, and feet through at the base, growing over an ancient fallen fir, which was feet through—growing with its roots enveloping the fallen trunk in such a way as to prove that the standing tree had germinated after the dead trunk had come to the ground. The combined ages of the two trees must have been seven hundred years. *The fallen fir cut into with an axe was found to be fresh and undecayed.* [The figures in this note, from having been wetted, cannot be deciphered. Indeed, the whole note is almost illegible, and rests in my memory more than on paper. But Philip Ritz, of Walla Walla, and the young engineer Johnson, of Middletown, Connecticut, can supply the measurements and other data to fill the above blanks.—S. W.]

The Congressional Delegate from Washington Territory, in his letter hereinafter mentioned, speaking of the durability of the fir, says: "Washington Territory, west of the Cascade Mountains, covers an area of "about 20,000 square miles (exclusive of interior waters), three-fourths "of which are timbered lands. The timber consists of fir, cedar, pine, "spruce, hemlock, oak, maple, cotton-wood, ash, dog-wood, alder, and some "of the smaller varieties. The amount of the fir exceeds all the other "varieties combined, and the cedar stands second in quantity. As the fir "exceeds all other varieties in quantity, so also it does in utility, being "valuable for ship-building, house-building, fencing, spars, and indeed "almost every purpose for which wood is used. The test of the durability "of fir, as material for the construction of the hulls of vessels, is confined "to a period of about thirteen or fourteen years. In February, 1858, I "completed a schooner of over one hundred tons burden, built entirely of "Puget Sound fir. That vessel navigated the sound for ten years, and "then went to San Francisco, where she is still employed in the bay and "coasting trade. Last year, she was taken out of the water to replace her "lower planking, which had suffered from worms (the vessel having never "been coppered), and her timbers were found to be perfectly sound. The "Oregon Steam Navigation Company, a few years ago, bought the steamer "*Cascades*, which was built upon Puget Sound, of the fir of that region, "I think in the year 1860, and have been running her ever since without "repairs. The President of the Company, last summer, told me that she "was still perfectly sound, while other steamers built on the Columbia "River inland had been twice newly planked, and many of their timbers "replaced during the same period. Our fir timber is not only durable "but very strong, possessing the quality of stiffness in a very high degree. "I have not at hand the statements showing the strength of this timber,

"but must refer you to the reports of tests made at the United States Navy "Yard at Mare Island, in California. *These tests prove it to be stronger "than white oak.*"

The size and abundance of this timber are as marvelous as its durability. Captain Lennard, on his way up the Lower Frazer, was astounded at it, and he makes this statement in his volume on British Columbia: "A "little below Westminster, an extensive steam saw-mill has been estab- "lished, which deals in a very summary way with the gigantic timber of "these regions. I have alluded to the size attained by the fir in this part "of the world. My readers, will, however, hardly be prepared to hear "that a novice, having laid a wager to cut through a selected specimen "with an axe in three weeks' time, actually found himself, in spite of his "most strenous efforts, unable to accomplish his task. However incredible "this may appear, it is an undoubted fact."

The Hon. S. Garfielde, Delegate to Congress from Washington Territory, in a letter to Samuel Wilkeson under date of April 2, 1870, gives certainly a startling measure of the magnitude and abundance of this timber, but which will be accepted without question wherever this eloquent man of the Pacific coast is known. He says: "The size of the fir trees, "and the numbers growing upon given areas, in good timber districts, is "almost incredible to residents upon the Atlantic slope of the continent. "Trees often measure 320 feet in length, as I have several times demon- "strated, more than two-thirds of which are free from limbs. Fifty, sixty, "and sometimes as high as eighty good timber trees grow upon an acre of "ground. In the summer of 1868, I had two parties out cruising for "timber. The leaders of these parties were old and experienced lumber- "men. One of these parties found a 'berth' of timber, covering about "3,000 acres, which was so very fine that they took extra pains to ascer- "tain the facts in regard to it in order to satisfy me of the truth of their "report. They examined the forest carefully, and selecting an average "tree cut it down. That tree measured 42 inches in diameter at the "stump, and at the first limb, 200 feet above, it measured 22 inches—the "top or branching portion measuring 70 feet more. It was then ascer- "tained by measurement and count that there was an average of 80 such "trees to the acre throughout this berth. I do not give this statement as "an illustration of the *size* of our trees; for these were by no means large "ones; they were of the size, however, most convenient for milling pur- "poses, and their great length, free from limbs, and their number per "acre, make the average production very much more than is usually ob- "tained. Our loggers work no 'berth' of [fir] timber producing less than

"30,000 feet per acre—from sixty to one hundred and twenty thousand "feet being the more common yield. The Puget Sound lumber, which "is now exported to the extent of about one hundred and eighty million "feet annually, besides piles and spars, finds a market at San Francisco, "Callao, Valparaiso, the Sandwich Islands, Australia, and China. Many "cargoes of spars have been sent to Europe, principally to France for the "use of the French navy. The standard size for lower masts for that "market is 120 feet long, and 42 inches in diameter one-third of the dis- "tance up from the foot—and this after being hewn into octagonal shape."

Mr. M. H. Frost, member of the Washington Territorial Legislature from Snohomish county, in a letter upon the products of his district now before me, says: "The amount of timber per acre differs very much, "varying from fifty thousand to two hundred thousand feet per acre of "fir. *The cedar timber remaining* will yield from twenty thousand to "sixty thousand feet per acre. It is superior to the best of pine for "shingles, tubs, and pails, and only inferior to it for doors, sash, blinds, "and finishing lumber. I think it safe to estimate the vacant land in "Snohomish county at 400,000 acres, that will yield eighty thousand feet "per acre, leaving the farming lands on the river-bottoms out of the ques- "tion. I do not include in this estimate the mountainous portion of the "county, which in many places is clothed with a heavy growth of fir and "cedar, which in time will be brought down the rivers."

The soil which bears these monarch firs and cedars is washed by the Pacific Ocean. More than two hundred miles east of it, the chief engineer of the reconnoitering party sent out in July, 1869, to examine the proposed line of the Northern Pacific Railroad, saw the brothers and sisters of these trees, and thus reported upon them:

"Around Lake Pend d'Oreille, and for some miles westward, and all "along Clarke's River above the lake, as far as we traversed it, there is a "magnificent region of pine, cypress, hemlock, tamarack, and cedar tim- "ber, many of the trees of prodigious size. I measured one which was "34 feet in circumference and a number that were over 27 feet, and saw "hundreds as we passed along that were from 20 to 25 feet in circumfer- "ence, and from 200 to 250 feet high. A number of valleys containing "large bodies of this character of timber enter Clarke's River from both "sides, and the soil of these valleys is very rich."

Over hundreds and hundreds of square miles of area does this unequaled timber exist, astonishing for its size, perfection, and durability.

For hundreds of miles lineally the Northern Pacific Railroad's main line and branch will run through it and near it. The world has never seen such a trade in lumber outward by sea or inward by rail, as will be witnessed at the gateway of Puget Sound and on the western end of this railroad. That trade seaward was enormous in 1869. Fourteen huge saw-mills on Puget Sound alone supplied it. Some of these mills cut 150,000 feet a day. They are run night and day. To one of them is attached, as its machinery of foreign transportation, 17 ships. It gives constant employment to 1,000 men. It holds the fee-simple of over 100,000 acres of most carefully selected timber land. The entire product of the mills of Puget Sound in 1869 was over 170,000,000 feet.

These trees—these forests of these trees—so enchain the sense of the grand and so enchant the sense of the beautiful that I linger with the theme and am loth to depart. The waters of Puget Sound evoke wonder and reverence. Its islands and channels are an archipelago of beauty and majesty. Its waters in summer mirror the loveliness of the most augustly lovely things on earth—snow-clad mountains skirted and girdled with green. In winter they refuse to freeze, and give to December, January and February an autumnal mildness, garlanded oft with flowers, and softened with the breath of the tropics. But of all the marvels, and all the beauties, and all the majesties of this region, these forests of giant trees are chief. With a single exception of treeless interval, they tower on and near the land grant of the Northern Pacific Railroad from the Pacific Ocean to the Rocky Mountains. Forests in which you cannot ride a horse—in which you cannot possibly recover game that you have shot without the help of a good retriever—forests into which you cannot see, and which are almost dark under a bright midday sun—such forests, containing firs of three varieties, cedars of two varieties, and pine, spruce, hemlock, cypress, ash, curled maple, and black and white oak, envelop Puget Sound and cover a large part of Washington Territory; surpassing the woods of all the rest of the globe in the size, quantity, and quality of the timber. The firs in innumerable localities will cut 120,000 feet to the acre. Trees are common whose circumferences range from 20 to 50 feet, and whose heights vary from 200 to upward of 300 feet. The paradox of firs too large to be profitably cut into timber is to be seen all over Western Washington. These are rejected by the choppers, and trees having diameters ranging only from 30 to 50 inches are selected, and yield from 70 to 200 feet in length of solid trunk free from limbs and knots. The cedars of Washington are as thick through as the firs, but not as tall. So prodigal is nature in this region, and so wastefully fastidious as man, that lands yielding only 30,000 feet of lumber to the acre

are considered to be hardly worth cutting over. Forests yielding 100,000 feet and upward are common all around Puget Sound. The wood of the firs and cedars, unequaled for lightness, straightness of cleavage, and resistance of moisture, and stronger than oak and more retentive of spikes and tree-nails, will supplant all other material for ship-building on both shores of the Pacific Ocean. Last year, Puget Sound exported above 150 million feet of lumber, 20 millions of lath and shingles, and an immense amount of masts, spars, and piles. This product of the as yet scarcely scarred forests of Washington Territory was sold in California, South America, Australia, Japan, China, the East Indies, and Europe. It furnished lading to 113 ships, 491 barks, 45 brigs, and 87 schooners.

CLIMATE OF PUGET SOUND.

The unbelief in the favorableness of the climate of Puget Sound, which prevails as much in England as it does in the rest of Europe (although England has through the Hudson Bay Company occupied for over two hundred years the country of which the Sound is a part), and which prevails all over the United States, excluding the half-dozen counting-houses of gentlemen once connected with the fur trade, may demand the record proof of meteorological observations kept by scientific men to show that the country is not bleak and inhospitable. Such proof is at hand. Surgeon Alexander Rattray, of the Royal Navy, has published a Meteorological Abstract for Esquimalt, Vancouver Island, for the year 1860–61. Esquimalt is three miles from Victoria. Both are on almost the extreme south end of Vancouver, and each is considerably south of Bellingham Bay, the principal seat of the American coal-mining operations. Rattray says: "This abstract goes far to prove that we enjoy, as "a rule, fine weather. Of the three hundred and sixty-five days of the "year no fewer than one hundred and eighty-seven, or fifty-one per cent., "were fine, the remainder being dull, showery, rainy, etc. During the "winter months, fine weather accompanying frost is by no means uncom-"mon or of short duration. Rain fell on one hundred and eighteen days, "or once in every three and one-eleventh days; most heavily and fre-"quently during the winter months from October to February. Snow "fell on twelve days only, and then neither heavily nor for any length of "time. The thermometer fell only eleven times below freezing during "the year—a good indication of the mildness of the winter.

"The following are the usual characteristics of the different seasons: "The spring is short, and lasts from the beginning or middle of March to "the end of April or beginning of May. In early March the weather "undergoes a marked change, and a drier and milder atmosphere forms a "decided contrast to that of the cold and wet winter months that precede "it. Trees bud and come into leaf, and toward its close various wild "plants are in flower. The prevailing weather is characterized by fine "mild days, still alternated, however, with occasional rain and squalls. "Toward the latter end of April, fine weather has fairly set in, with mild "dry south and south-west winds; but farming operations may usually be "commenced with the utmost safety in the beginning or middle of March, "as the keen, biting 'March winds' of the English climate, so detrimental "to the budding fruit and vegetation generally, are seldom, and never "severely felt here.

"*Our beautiful and protracted summer begins with May and ends with* "*September*. During these glorious months we are cheered by a bright "sun, a clear and often cloudless sky, lasting frequently for days together, "with gentle sea and land breezes. Rain seldom falls, and never heavily; "fogs and mists are rare; the season is delightful. Sometimes, indeed, "the power of the sun becomes excessive, and the soil very arid from the "want of rain; but these drawbacks are but trifling, and do not interfere "to any appreciable extent either with individual arrangements or agri- "cultural or horticultural operations. The heavy English 'harvest rains' "of August and September are unknown in Vancouver's Island, and the "crops are usually sown, reared, cut and housed in fine weather.

"The autumn, which lasts during October and November, presents a "marked change. Cold and moist northerly winds succeed the dry south- "erly breezes of summer; fogs begin in October, and occasionally during "the latter end of September, with a moist atmosphere and frequent rains. "These, however, alternate with periods of fine mild weather, sometimes "lasting for ten days or a fortnight, and forming what, in the aggregate, "is termed the 'Indian Summer.' So mild, however, is the temperature, "even at the latter end of November, that wild strawberries may occasion- "ally be seen in bloom.

"During the winter, which lasts from the beginning of December to "the end of February, cold, moist northerly and southerly winds prevail, "with frequent rain and occasional fogs, the latter, however, less common "than in the autumn. This state of things is often pleasantly varied by "periods of fine, clear, frosty weather, lasting from two to four or even "eight or ten days. The thermometer is seldom much below zero; snow "is uncommon, and neither falls heavily nor lies long; nor are the frosts "intense or long-continued, ice seldom being more than an inch thick. *So*

"*mild is the usual winter weather of this colony, that most farmers leave* "*their stock unhoused and at large during the entire season.* More severe "and prolonged winters *occasionally* occur, as during the past year of "1861–62, and during 1852–53; *but these are exceptional,* and do not "happen more frequently here than in England and other countries with "similar climates."

It is the colony at large of Vancouver's Island which Surgeon Rattray is speaking of, not of its great naval harbor and station, Esquimalt, which is nearly at the extreme south point of the island. He is talking from his records of the island at large, which is 290 miles long, and, on an average, 55 miles wide; and which lies between the parallels of 48° 17' and 50° 55' north latitude, 123° 10' and 128° 30' west longitude. If what he says of Southern Vancouver is true, much more is it true of Puget Sound, lying to the south of Vancouver.

Vancouver Island occupies in the Pacific very much the same position that England does in the Atlantic. London and the South of England lie nearly in the same latitude as Victoria and the lower end of Vancouver Island. The "Puget Sound" of the Northern Pacific Railroad lies almost wholly south of the island, and extends below it ninety miles. The influences which make the climate at Victoria and Esquimalt prevail all over the sound, but in a greater degree and with a more marked effect.

A comparison of meteorological records shows that the extremes of temperature are less at the northern end of Puget Sound than in England —that those incessant variations and sudden changes from heat to cold which characterize England are rare on Puget Sound, and, when they do occur, that they are less sudden and intense particularly in summer—that the atmosphere of the northern part of the sound, both winter and summer, but especially in the summer, is drier than the proverbially humid climate of England—that the heavy harvest rains of the English summer and autumn months, which almost annually damage the crops of the Kingdom, are unknown on and about Puget Sound—that rain falls in London once every two days, at the north end of the sound only once every three days —that in the months of seed-time, March and April, and harvest, July, August and September, rain does not fall so often, or so heavily on the sound as in England—that the summer rains about Puget Sound are only showers, while those of England are too frequently thorough soaks.

Any Englishman who has snatched a harvest in dry condition from the rains and showers which eternally crown the agricultural year in Great

Britain, and any American doomed by the accident of birth and the tyranny of circumstances to live east of the Mississippi River, may well be satisfied with the climate of Puget Sound as recorded and described by Surgeon Rattray. But excellent as it is, he uses it as a foil to set off *the greater excellences of the climate of British Columbia east of the Cascade range, and of course far north of the line of the Northern Pacific Railroad and of its land grant.* He says: "The climate of the interior or "agricultural districts is finer, warmer, and drier in summer, and less "rigorous in winter. This is especially the case along the valley of the "Thompson River, *where snow seldom lies*, a circumstance which adds "greatly to its value for agricultural and pastoral settlement." All of that country, interior British Columbia, has its mission—to be tributary to the Northern Pacific Railroad. But of that I shall speak in another place. Now and here I will only say that the excellences of climate and soil, truthfully ascribed to the region of British Columbia east of the Cascade range, and between the international boundary latitude of 49° and latitude 54°, exist more aboundingly, and prevail more characteristically, south of the boundary and within the land grant of the Northern Pacific Railroad.

Edward Eldridge, of Whatcom County, late Speaker of the House of Representatives of Washington Territory, writing of the climate of Bellingham Bay, says: "The climate here is unsurpassed. Sickness is "almost unknown. In winter the southeast winds prevail, bringing the "warm air of the south and rain, while in summer westerly winds prevail "during the heat of the day, sweeping in the tonic sea-air of the Pacific, "which dies away at sundown and is followed by the cool air from the "eternal snows of Mount Baker. This enables the weary laborer to enjoy "refreshing sleep under a pair of blankets during the hottest time of the "year, while the inhabitants of the interior and Eastern States are pant-"ing for a breath of cool air. Here the thermometer scarcely ever gets "down to zero or up to 90°. Last winter (1868–69)the mercury never "got down to 20°, and the ground was never covered with snow. It "commenced snowing twice, but enough to cover the ground did not fall. "*Several times two crops of potatoes have been raised on the same ground "in one season—the first crop planted in the end of March, the second "about the middle of July.* Breathing such air and using such water as "is here—springs cold as ice and clear as crystal—with temperate habits, "in the absence of accidents and hereditary disease, *sickness is impos-"sible.*"

A letter from James G. Swan, dated at Port Townshend, on the 4th day of January, 1870, and enclosing fourteen varieties of flowers

that day blooming and picked in the open air, was shown to Horace Greeley with its contents on its receipt in New York City. Mr. Greeley said of this startling evidence of the marvelous climate of Puget Sound, in the *Tribune* of January 31, 1870: "We have been shown a rich "variety of garden-flowers, gathered while still fresh, and living in the "open air at Port Townshend, on Puget Sound, on the 4th instant. Port "Townshend is above the 48th degree of north latitude—considerably "further north than St. Paul or Quebec. The mildness of climate which "distinguishes our western from our eastern coast has seldom been more "strikingly exemplified."

Hereinbefore, and when among the monarch firs and cedars, I introduced Mr. M. H. Frost, of Mukilteo, a resident witness, to the effect that the vacant lands in Snohomish County amount to 400,000 acres, which will yield 80,000 feet of lumber to the acre, "leaving the farming lands on "the river-bottoms out of the question." It will be satisfactory to know what is the winter climate in which the future choppers of those 400,000 acres will work. Snohomish is in the northern part of Washington Territory. Mr. Frost says:

"The climate of Puget Sound compares favorably with that of Vir-"ginia. There was not a flake of snow at my place, Mukilteo, last winter "(1868–69), and but little in the Territory, it being the mildest winter "for several years. The ground was slightly frozen a few times. The "lowest range of the thermometer was twelve above zero. In January, "1862, the Snohomish was frozen, and remained closed until the month "of February. The ice attained a thickness of eight inches. The Sno-"homish was again frozen in January, 1867, and remained closed for two "or three weeks. In this vicinity we expect from four to six inches of "snow. As we approach the Cascade Mountains the depth of snow "increases. It generally lies on the ground for two or three weeks. The "mercury seldom gets down to zero. Stock does well on the river-bottoms "and in the valleys during winter, without feeding, working cattle only "being housed and fed. Frost has sometimes occurred late enough to "injure early blossomed fruit, but instances of this are rare."

SOIL AND PRODUCTIONS OF PUGET SOUND.

To what degree of exaltation the mind of a man accustomed to sauer-kraut as a diet, and bedded in the faith that sauer-kraut is a staff of life, may be raised by a vision of immortal and perpetual cabbage, I know not. But the Hon. S. Garfielde, of Olympia, doubled me up wholly with a statement which I found had a voucher in the experience of many other residents of that place. He illustrated the favorableness of the climate of Olympia, and the richness of its soil, by telling of a neighbor who sowed a pinch of cabbage-seed in the spring and cut the heads in the fall. *The next year, and for six years thereafter in succession, from six to nine heads of perfect cabbage grew on the old stalks!* The publication of this fact ought to depopulate the sauer-kraut countries of Europe.

I have stated upon the unquestionably good authority of Edward Eldridge, of Bellingham Bay, that in Whatcom County, in which that town is, two crops of potatoes have been several times raised on the same ground in one season. Upon the productiveness generally of the river bottom-land of that favored region [it is fenced in on the north by the 49th parallel of latitude!] he writes: "The average character of the soil "of the agricultural lands is a mellow, brownish loam, resting on a heavy "clay subsoil. But little grain has yet been raised in this county. It has, "however, been proved that from fifty to sixty bushels of wheat can be "raised to the acre on bottom-lands. Corn does not ripen well." [Those two pairs of blankets at night are what ails Corn on the Pacific coast.—S. W.] "All sorts of vegetables grow to great perfection. Thirty tons of "rutabaga turnips have been raised to the acre. Onions grow from the "seed from 600 to 1000 bushels per acre. The world cannot beat What-"com County for potatoes. Irishmen acknowledge this. Potatoes shipped "from here to San Francisco fetch double the price of California ones. "This is pre-eminently a fruit-growing country. Apples, pears, plums, "and cherries yield enormous crops of luscious fruit. In my orchard, I "have over seventy varieties of apples, embracing all the finest varieties "known in Europe and the States, and nearly all do well. The Red "Astrachan and Early Harvest ripen about the end of July. This year "the Madeleine Pear ripened about the 10th of July; the Bartlett ripened "about the middle of August. Other varieties precede it, such as Early "Butter, Osborne's Summer, the Beurre Brown, etc. Cherries ripen "early in June; plums, from August to October. Peaches will not ripen, "although some varieties do well in a few locations; but they cannot be

"depended on. The same may be said of grapes." [He is talking of grapes hanging in the open air from the lattice-work of the north parallel of latitude 49.—S. W.] "Strawberries, blackberries, and raspberries, and "the three varieties of currants, red, white, and black, do here seem to be "in their native soil. Gooseberries, however, with the exception of "Houghton's Seedling, and one or two other varieties, are subject to "mildew. Some thirty of the best English varieties were introduced here "about ten years ago by Mr. Bennett, an eminent practical nurseryman. "Our waters teem with all varieties of fish. Along our shores all sorts of "shell-fish can be found. The forests abound with deer, rabbits, and "partridges. During winter, the marshes and waters are covered with "ducks and geese. *There is no part of the world in the temperate zone "where a man can obtain a living so easily, and live so long, as he can in "Washington Territory, west of the mountains, and in Whatcom County in "particular.*"

John Y. Sewell, writing from Whidby Island, to Thomas H. Canfield, the General Agent of the Northern Pacific Railroad, in August, 1869, said: *Corn in some localities on this island does well*, but as a general "thing does not do well owing to the delightful cool nights we enjoy in "the summer months. *I raise some corn quite successfully on my place "every year.* The Assessor reported in 1868 that there were on the "island 6,829 fruit-trees of different kinds, principally the apple. Apples, "pears, plums, cherries, etc., etc., do exceedingly well. Indeed, both the "climate and soil seem adapted to their culture. In addition to those "named, all the smaller kinds of fruit grow well, such as gooseberries, "currants, strawberries, raspberries, etc. The mean temperature of the "island is about 48°. We have neither excessive heat nor excessive cold. "In 1863, we experienced what our people called 'cold weather,' but it "was not to be compared with any of the winters in the same latitude in "the Eastern States, either in degree of severity or duration. As a gen-"eral thing, our winters are open and mild; in fact, some of them have "been what might be termed 'southern winters.' Our usual time for "sowing spring wheat has been February. *In that month last winter the "pear-trees on my place were in bloom;* and at no season since my settle-"ment here has it been necessary to house the cattle. In some few in-"stances, however, persons have taken the precaution to do this; but there "is a doubt whether stock thus treated fares or thrives better than that "permitted to roam about, with little or no care taken of it, in a time of "snow. Snows are not frequent, and when they do occur they are so light "and of such short duration that the cattle will take shelter in the woods "contiguous to their browsing-ground, and so pass the winter months *that, "strange as it may seem, they look better than those that are kept up and fed.*

THE FISH OF PUGET SOUND.

The fisheries of Puget Sound are those of the Sound proper and of the waters commercially appurtenant. Vicinity makes this appurtenance. The cod, hake, and halibut of Alaska, and the North Pacific generally, are about eight hundred miles nearer to the drying-racks on Puget Sound than to those of San Francisco. Therefore they belong to Puget Sound, and Puget Sound will take that trade in fish whenever she wants it; and it can no more be got away from her than Norfolk can get away the cod and mackerel fishery from Gloucester. But the variety and abundance of fish of the highest excellence in Puget Sound proper, is as striking a characteristic of these waters as are its timber and its climate. Salmon of many species—for of this famous fish are many kinds, differing much in quality and value—crowd the seas, bays, and streams at certain seasons of the year. They abound literally in millions. The statement often made to me by residents, that "salmon can be taken in any desired quantities," is most strictly true. In water of convenient depth, they are seined. In deep soundings, they are taken with the hook. No other facility and no other outlay are necessary for the prosecution of the business of fishing them than a good seine and men enough to work it. An idea of the abundance of the salmon in Puget Sound can be got from the fact that, in August, 1869, at the fishery of Morris H. Frost, at Mukilteo, at the mouth of the Snohomish, 1,700 were taken at one haul. The Indians catch large quantities, and the Hudson's Bay Company long ago established a profitable export trade in them. Some Yankees from Massachusetts and Maine have just got into the business, and they will show that it is capable of indefinite expansion. Cured and salted, these fish sold last year for ten dollars a barrel for shipment to China and the Sandwich Islands, and down the South American coast. But there is a fish, so superior that the salmon is not worthy of lying in the same basket with it, and the speckled trout only as a gracious favor should be permitted to get into the frying-pan in which it has been cooked—the cod, the true *Gadus*. That is in Puget Sound. It especially abounds on the west side of Vancouver and the north of Fuca. But it is everywhere, and it is a kingly fish in its proportions. It averages two and a half feet in length, with a girth round the shoulders of eighteen inches. It has the flavor of the Block Island cod, and of food for man or gods nothing more can be said than that. These fishes are seined at several places on the sound, and caught also with the hook in deep water. Their price

last year, salted and in the barrel, was from sixteen to twenty dollars. But these Puget Sound cod are only the flank of the main body of these admirable fishes. The banks on which they live begin on the north-western extremity of Vancouver and extend beyond Alaska. Whaling captains have assured me that on the old Russian American whaling-ground they have at times sensibly felt a retardation of the motion of their ships under shortened sail by reason of the masses of these fishes. Halibut abounds in Puget Sound of enormous size, and of a delicacy and tenderness not known in its Atlantic congener. The quantity in which they exist here may be estimated from the statement of an official of the Hudson's Bay Company, that in forty-eight hours a fishing-vessel of six hundred tons can be loaded with them. Eulachon, a very delicious fish of the size of a small herring, is in shoals on the North Pacific coast as far south as the mouth of the Columbia. Sturgeon of immense size are plenty off the mouths of the Frazer and other rivers: So abundant is thi[illegible] that isinglass made from it is a regular article of export by the Hudson's Bay Company. Herrings are in countless millions. Smelts—precisely the delicate fish of New York Bay—are taken by boat-loads. Dog-fish in incredible quantities are taken by the Indians solely for their oil, and this oil is a staple export of the Hudson's Bay Company. There are several varieties of rock-fish and deep-sea perch, the latter often running to eight pounds weight. Of speckled trout in the [illegible] reams flowing into the sound, even to "six-pounders," there seems to be no end.

I have said that the fish of the coast up to Alaska belonged to Puget Sound by force of vicinage. They belong to it as a commodity by force of climatic law. The cod-fish, cured in San Francisco, is dried into horn. The climate is too hot and dry for the business of curing fish. It never can be established there. The atmosphere of Alaska is a suspended rain, and fish cannot be cured there. All those taken on the Aleutian banks have, for want of other curing-ground hitherto, been carried to San Francisco, and, as I have said, are there converted into the consistency of cows' horns. The air of Puget Sound on the contrary, like that of Nova Scotia and Maine, has the requisite coldness and moisture and evenness to perfectly cure this fish. Of course, after the business is started on the Sound, San Francisco fish cannot be sold where there are Puget fish. In like manner, this Puget Sound is bound to have a monopoly of what is left of the American whaling business. San Juan de Fuca is distant but from ten to eighteen days from the best ground left to our harpooners. Puget Sound is the cheapest and best place in the Pacific in which to build, fit out, refit, repair, and discharge. If it will pay to carry cheap petroleum by rail from Pennsylvania nearly over all the United States, it will pay to carry sperm oil and bone for distribution 1,750 miles to Lake

Superior, or 750 miles to the Missouri River. If it shall be deemed economy to ship the proceeds of voyages home to New Bedford by vessel, Puget Sound is certainly a better place to do it from than the Sandwich Islands. It would not be a rash prediction to say that the whaling business will be bodily transplanted from Massachusetts, to the Sound, or wholly supplanted on the Atlantic side by enterprise on the Pacific side. In 1868, a ship was built on the Sound expressly for the business. It is the seed of a fleet whose voyages will by-and-by leave to New Bedford nothing of the magnificent vexation of distant seas in pursuit of the whale, save its realized wealth and its traditions.

But the salmon are so appurtenant to the western division of the Northern Pacific Railroad, by reason of their annual diffusion through all the streams west of the Rocky Mountains tributary to the Columbia, and that empty into Puget Sound and the Gulf of Georgia—these fishes are so important as a present and future article of commerce, and are so interesting in themselves, that I will finish here on the Sound what I have got to say about them. Admonished by my experience, I shall speak by book and authority. For when a mountain-man in my camp on the Pelouze river, in narration calm and unaffected, affirmed that the salmon in their spring migrations so filled the uttermost headwaters of all the rivers running into the sea, that it was a common thing for saddle and pack horses crossing these streams and streamlets to be frightened, and made to plunge and jump by the fish "flopping" against their legs, I looked at him with admiration, and said to myself: "Certainly you are the champion liar of "America." But that mountain-man did not lie. Since I came home I have got acquainted with another and famous mountain-man, John Harmon, by birth of Vermont, by nineteen years of service of the Hudson's Bay Fur Company. John kept a journal at the several factories at which he was stationed. There is in it the following entry, made at the Company's post at Stuart's Lake, in latitude 55°, longitude 125°, on the 2d of September, 1811: "We now have the common salmon in abundance. "They weigh from five to seven pounds. There are also a few of a larger "kind which weigh sixty or seventy pounds. As soon as the salmon "come into this lake, they go in search of the rivers and brooks that fall "into it; and these streams they ascend so far as there is water to enable "them to swim; and, where they can proceed no further up, they remain "there and die. None were ever seen to descend these streams. They "are found dead in such numbers in some places as to infect the atmos-"phere with a terrible stench for a considerable distance round." Harmon settles to my mind a question much discussed west of the mountains: "Do the salmon, after spawning, return to the sea?" He says distinctly

that they do not, and he watched their migration for years. He also states another fact not generally known: "September 20, 1814.—We "have had but few salmon here, this year. It is only in every second "season that they are very numerous; the reason of which I am unable "to assign." But to return to Harmon as a keenly observant witness to the superabundance of these fishes: speaking of the Indians of New Caledonia, north of Frazer's River, he says: "In this manner the natives "barely subsist, until about the middle of August, when salmon again "begin to make their appearance in all the rivers of any considerable "magnitude; and they have them at most of their villages in plenty un- "til the latter end of September or the beginning of October. For about "a month they come up in crowds; and the noses of some are either worn "or rotted off, and the eyes of others have perished in their heads; and "yet in this maimed condition they are surprisingly alert in coming up "the rapids. These maimed fishes are generally at the head of large "bands, on account of which the natives call them Mi-u-ties or Chiefs. "The Indians say they have suffered these disasters by falling back among "the stones when coming up difficult places in the rapids which they "pass. The Carriers take salmon in the following manner: All the Indi- "ans of the village assist in making a dam across the river, in which they "leave places to insert baskets or nets of wicker-work. These baskets "are generally from 15 to 18 feet in length, and from 12 to 15 in circum- "ference. The end at which the salmon enter is made with twigs in the "form of the entrance of a wire mouse trap. When four or five hundred "salmon have entered this basket, they either take it to the shore and "empty out the fish, or they take them out at a door in the top, and "transport them to the shore in their large wooden canoes, which are con- "venient for this purpose."

Clarke, one of the famous conductors of Lewis and Clarke's Expedition, in going up the Columbia, above the Snake, made a note of the salmon he saw, which the editor of the History thus extends: "On the "left bank of the river opposite to this river, is a fishing place, consisting "of three mat-houses. Here were great quantities of salmon drying on "scaffolds, and indeed from the mouth of the river upward he saw im- "mense numbers of dead salmon, strewed along the shore or floating on "the surface of the water, which is so clear that the salmon may be seen "swimming at the depth of fifteen or twenty feet. . . . The multi- "tudes of this fish are almost inconceivable. The water is so clear that "they can readily be seen at the depth of fifteen or twenty feet; but at "this season (October 17, 1805,) they float in such quantities down the "stream and are drifted ashore that the Indians have only to collect, split,

"and dry them on the scaffold. Where they procure the timber of which "these scaffolds are composed he could not learn; but, as there are nothing "but willow bushes to be seen for a great distance from the place, it is "rendered very probable, what the Indians assured him by signs, *that they "often used dried fish as fuel for the common occasions of cooking.*" The cash payment of one dollar and a half a pound, the spring price of Kennebec salmon in New York, will aid the appreciation of this fact.

At the Dalles of the Columbia, the ascending salmon are forced to pass through narrow gateways of rock, and are crowded closely together in a current running with tremendous power. To catch the helpless fish there is simply to scoop them out, or to jerk with an upward motion through the foam an iron hook loosely attached to the end of a pole by a lanyard rove through an eye. In July, 1869, I saw members of the Ways and Means Committee of the House of Representatives surrender themselves to the novel sport of catching salmon without art, without bait, and in such numbers as to speedily exhaust themselves. One man of rare muscle and endurance plied the large scoop-net till he had landed one hundred and thirteen within an hour. Indian children of years too tender to handle the scoop, caught the great and beautiful fish anywhere and everywhere by the use of the hook rigged as I have mentioned. How precisely the picture presented by these wet-nosed and almost naked little wretches was like that the famous Hearne saw far to the north, but in waters, like those of the Columbia, entered by the salmon from the Pacific Ocean! He says:

"It may appear strange that a person supposed to be almost blind "should be employed in the business of fishing; but, when the multitude "of fish is taken into the account, the wonder will cease. Indeed, they "were so numerous at the foot of the fall that when a light pole armed "with a few spikes, which was the instrument the old woman used, was "put under water and hauled up with a jerk, it was scarcely possible to "miss them. Some of my Indians tried the method, and seldom got less "than two at a jerk, sometimes three or four. Those fish, though very "fine and beautifully red, are but small, seldom weighing more than six "or seven pounds. Their numbers at this place were almost incredible, "perhaps equal to anything that is related of the salmon in Kamskatka "or any part of the world."

Paul Kane, who wandered as an artist among the Indians of North America from Canada to Vancouver's Island, through the Hudson's Bay Company's territory and Oregon, and back again, when at the Chaudière, or Kettle, Falls of the Columbia River, made inquiries about the annual migration of the salmon up that stream, and subsequently wrote about it

as follows: "The salmon commence their ascent about the 15th day of "July" [he must mean the ascent of the falls, and not of the river], "and continue to arrive in almost incredible numbers for nearly two "months, more resembling a flock of birds than anything else in their ex- "traordinary leap up the falls" [these are eighteen feet high, and 3,000 feet long], "beginning at sunrise and ceasing at the approach of night. "Seepays, the Colville Indian 'Salmon Chief,' told me that he had taken "as many as 1,700 salmon, weighing on an average thirty pounds each, "in the course of one day. Probably the daily average taken in the "chief's basket is about four hundred. By the time the salmon reach "the Chaudière Falls, after surmounting the numerous rapids impeding "their journey from the sea, a distance of between seven hundred and "eight hundred miles, they become so exhausted that, in their efforts to "leap these falls, their strength often proves unequal to the task, and, "striking against the projecting rocks, they batter their noses so severely "that they fall back stunned and often dead, and float down the river, "where they are picked up some six miles below by another camp of In- "dians who do not belong to the Salmon-Chief's jurisdiction. None of "these salmon coming up from the sea ever return, but remain in the "river and die by thousands; in fact, in such numbers that in our pas- "sage down the river in the fall, whenever we came to still water, we "found them floating dead or cast up along the shore in such vast num- "bers as literally to poison the atmosphere. The young fish return to the "sea in the spring. Strange to say, nothing has ever been found in the "stomachs of salmon caught in the Columbia River; and no angler, "although frequent trials have been made by the most expert, has yet "succeeded in tempting them to take any description of fly or other bait. "After the expiration of one month, the Salmon-Chief abandons his ex- "clusive privilege, as the fish are then getting thin and poor, and allows "all who wish to take them. For this purpose some use smaller baskets, "made like the chief's; others use the spear, with which they are very "expert, and an ordinary spearman will take easily as many as two hun- "dred in a day; others use a small hand net in the rapids, where the fish "are crowded together and near the surface."

McLean, a noted factor of the Hudson's Bay Company, who lived for years between the Rocky Mountains and the Pacific, says of this fish: "The salmon (the New Caledonian staff of life) ascend Frazer's River "and its tributaries from the Pacific in immense shoals, proceeding "toward the sources of the streams until stopped by shallow water. "Having deposited their spawn, their dead bodies are seen floating down "the current in thousands. Few of them ever return to the sea, and, in

"consequence of the old fish perishing in this manner, they fail in this "quarter every fourth year." Subsequently, he tells a very queer thing—nay, I take to myself rebuke for this language, wanting in reverence for the Providence which, all over the globe, provides food for the creatures the Creator has made. McLean says: "I have already observed that the "salmon fail periodically, and the natives would consequently be reduced "to the utmost distress, did not the goodness of God furnish them with a "substitute. Rabbits are sent to supply the place of the salmon; and, "singular as it may appear, these animals increase in number as the salmon "decrease, until they swarm all over the country. When the salmon re-"turn, they gradually disappear, being destroyed or driven away by their "greatest enemy, the lynx, which first appears in smaller, then in greater "numbers—both they and their prey disappearing together."

Surgeon Rattray, writing of the Puget Sound salmon, says: "Several "varieties of salmon are caught, and thousands die annually in the Frazer, "Coivetchin, and other rivers of both colonies, while passing up the "stream to deposit their spawn. . . . The rivers of this colony, "especially the Frazer, and the coast of British Columbia generally, "abound with salmon, which are caught by the natives *all the year round*, "but more particularly in the salmon season in the months of September "and October, when they obtain their winter stock. The salmon caught "in the rivers are said to be finer and better adapted for curing than those "of Vancouver Island and the coast."

Captain Lennard perhaps describes an injury, instead of a conformation, when he says of the salmon he saw on the Frazer River: "This fine "fish is everywhere met with throughout the waters of Vancouver, and fre-"quently attains a large growth. Those of the Frazer River are dis-"tinguished by the peculiarity of their nose being twisted on one side, "which gives them a very comical appearance. I do not know whether "this phenomenon can be accounted for by the force of the current these "fish have to stem. In addition to this deformity, the bodies of the salmon "taken out of this river are frequently much scored, gashed, and disfigured "by old wounds, the result of accident, and arising from collision with the "rocks and shallows of this impetuous stream. Sturgeons of gigantic "size, weighing at times as much as five or six hundred pounds, are also "taken in the Frazer River."

At only one place is the curing and marketing of these fishes organized. This is Oak Point, on the Columbia, fifty miles below Portland. Four concerns are there engaged in the business of canning them for exporta-

tion. One of them, by virtue of a secret process used, has nearly the monopoly of the business. In 1868, it paid them a profit of $40,000. The salmon put up by the other concerns is said to come to market soft, and "washed" together. Hapgood & Hume's gets there firm, and of better flavor than when fresh. This superiority is attributed by many to the use of nitric acid put on the bones of the fish with a feather just before canning. Hapgood & Hume use seines from two hundred to three hunded fathoms long, drawn down the river. They pay thirty-seven and a half cents each for all fish of a certain size which cannot pass through the meshes —red salmon, however, not white. The fish taken are headed, disemboweled, and cleaned, *and wiped dry with a dry cloth.* After coming out of the water they are not suffered to get wet. Moisture spoils their delicate flavor. They are cut in strips of a size to fill round tin cans six inches deep, and rolled up, bones and all. The cover of the can is then soldered on, but with an air-hole left in the top. The cans are put up in boiling water to expel the air, and the air-hole is closed with solder. It was said, in July, 1869, that Hapgood & Hume would that year pack 30,000 boxes, each box containing twenty-four cans, each holding two pounds of salmon. In that month, one day, between eight o'clock in the morning and four o'clock in the afternoon, there were caught, cut, canned, and sealed by that firm, in the presence of the Delegate from Washington Territory, my informant, 7,296 cans of red salmon.

The salmon of the mouth of the Columbia, like those of Puget Sound, and the Lower Frazer and other Puget Sound rivers, are superb—unquestionably, in the judgment of most men, the best fish in the world. They are fresh in from the sea. But I find in my note-book a memorandum of information received, which I believed to be true immediately after doing my best to eat a portion of three salmon I was mean enough to stop with a scoop-net in their hard journey through the Dalles. It is this: "Only three in a hundred caught above are sound and good. Long "journey wounds them about head and tail. Die after spawning. Low "water leaves millions of them above." But there is this more cheerful memorandum in that note-book: "Won't the Northern Pacific Railroad "popularize Salmon among the unfortunate occupants of the Atlantic "slope? Won't it make the Fulton Market robbers, that charge a dollar "and a half a pound for it, get up and get? YOU BET!"

"GLITTERING GENERALITIES."

On the eastern coast of the United States, Nature provided for a distribution of commerce. On the western, she provided for a concentration of it. Imagine two harbors of importation and exportation on all the Atlantic coast; imagine the business, coastwise and foreign, that would be concentrated in these, and you have a measure of the commerce that, triple-banked, will some day crowd the bay of San Francisco, *and the archipelago of bays, canals, and harbors, Puget Sound—in what proportion distributively between the two?* At least as four to one in favor of Puget Sound.

The economy of the shorter line from Asiatic ports to Puget Sound will give to Puget Sound the commerce of transhipment from China and Japan. But the Northern Pacific Road will not take the transcontinental commerce between Asia and Europe unless its line is shorter in time and cheaper in freight charges than the Union Pacific. The time is not far off when the saving of one day in the circuit of the globe will be deemed of importance. In railroading, distance governs. The shortness of the degrees of longitude under the route of the Northern Pacific Road gives this line an advantage over all those south of it whi h cannot be overcome or even resisted. If this advantage shall be thrown away in the location of the road, controlling empire in commerce and boundless wealth will be thrown away.

The route for steamers from San Francisco to Japan and China is up the Pacific coast as far as the north end of Vancouver's Island, and thence westward, in order to avail of the short degrees of longitude. The northing thus made is nearly 900 miles. Vessels coming to our coast from Asia make the entrance into Puget Sound from three to seven days before they get off the gate into San Francisco Bay.

The Atlantic coast from Maine to the Texas boundry abounds in good harbors, and in rivers the channels of extended interior commerce. The Pacific coast, on the contrary, possesses but two good seaports, the bay of San Francisco and Puget Sound. These two harbors are seven hundred miles apart.

Think of what was often said to me on Puget Sound! "Frequently a "single tree is fallen which is worth, alongside of the ship, ready for "shipment, as much money as would pay for 200 acres of the Govern- "ment land on which it grew."

He gravely erred who put on record the statement that "the area of "good agricultural lands in the territory of the United States was almost "without limit." That vast portion of the United States south of latitude 43°, west of longitude 98°, and east of the Sierra Nevadas, cannot be cultivated without irrigation, and irrigation cannot be accomplished save in the valleys of streams and at the feet of mountains; not till after the wooded and watered lands north of 43° are taken up and occupied will the soil of the vast rainless and treeless district above bounded begin to receive a steady emigration, flung back from the better districts by pre-occupation.

Professor Maury wrote: "The trade-winds place Vancouver's Island on "the wayside of the road from China and Japan to San Francisco so com-"pletely that a trading-vessel under canvas to the latter place would take "the same route as if she were bound for Vancouver's Island. So that "all return cargoes would naturally come there in order to save two or "three weeks, besides risk and expense."

There is a very bad show for a British Pacific Railroad. The construction of that portion of it within British Columbia alone would take the bottom dollar out of the New Dominion's treasury, and out of its credit, too. See the measurement of the eight Passes through the Rocky Mountains north of the boundary line.

NAMES OF THE PASSES.	RIDGE OR DIVIDE.		
	Lat.	Long.	Alt.
			Feet above sea.
1. Red Stone Creek or Boundry Pass, from Waterton River to the Kootanie (partly on American ground). Blakiston	49·06	114·14	6,030
2. British Kootaine Pass, by Railway River to the Kootanie. Blakiston	49·27	114·57	5,960
3. Crow's Nest Pass, by Crow River to the Kootanie..	49·38	1:1448	.....
4. Kananaski Pass, from Fort Bow by Ramsay River to the Kootanie (with a short tunnel 4,600). Palliser.	50 45	1:1531	5,985
5. Vermilion Pass, from the South Saskatchewan by Fort Bow (4,100 feet) to the Kootanie. Hector....	51·06	116.15	4,947
6. Kicking Horse Pass, by Bow River and Kicking Horse River to the Upper Columbia. Sullivan.....	51·16	116·32	5,420
7. Howse Pass, from Deer River by Blueberry River to the Upper Columbia	51·57	117·07	6,347
8. Tête Jaune Pass, from the Athabasca to the Upper Fraser	52·54	118·33	3,760

Having got through the Tête Jaune Pass (a narrow trough in the mountains 120 miles long), the projectors of the British Pacific Railroad would come into the country described by Viscount Milton and Dr. Cheadle

in this discouraging language: "British Columbia probably equals Cali-
"fornia in mineral wealth; but being as it were *a mere continuation of*
"*the Rocky Mountains to the Pacific*, a sea of hills, a land of mountains
"and forests, or shingly swells and terraces covered with bunch-grass, the
"farmer looks in vain for rich alluvial valleys." When Milton and Cheadle got through the Pass, they undertook to reach the Cariboo mines, and came very near starving to death in the endeavor, what time they dodged drowning in river torrents and dying of exhaustion from a struggle with the difficulties of the way. Here is their description of the country that finally beat them out: "No one who has not seen a primeval forest,
"where trees of gigantic size have grown and fallen undisturbed for ages,
"can form any idea of the collection of timber or the impenetrable char-
"acter of such a region. There were pines and thujas of every size, the
"patriarch of 300 feet in height standing alone, or thickly clustering
"groups of young ones struggling for the vacant place of some prostrate
"giant. The fallen trees lay piled around, forming barriers often six or
"eight feet high on every side; trunks of huge cedars, moss grown and
"decayed, lay half-buried in the ground on which others as mighty had
"recently fallen; trees still green and living, recently blown down, block-
"ing the view with the walls of earth held in their matted roots; living
"trunks, dead trunks, rotten trunks; dry, barkless trunks; and trunks
"moist and green with moss; bare trunks and trunks with branches
"—prostrate, reclining, horizontal, propped up at different angles;
"timbers of every size, in every stage of growth and decay, in every
"possible position, entangled in every possible combination. The
"swampy ground was densely covered with American dog-wood, and else-
"where with thickets of the azalea, a tough-stemmed trailer, with leaves
"as large as those of the rhubarb plant, and growing in many places as
"high as our shoulders. Both stem and leaves are covered with sharp
"spines, which pierced our clothes as we forced our way through the
"tangled growth, and made the legs and hands of the pioneers scarlet
"from the inflammation of myriads of punctures."

I have somewhere in my Notes called British Columbia "a tributary of the Northern Pacific Railroad." It is worse for Mr. Bull than that. The entire British Possessions between Lake Superior and the Pacific Ocean are a *dependency* of this railroad. Great Britain can't get into or out of this territory by rail save over American soil. That makes the region dependent on the Northern Pacific.

Divers engineers have put on sorrowful record their conclusions that the country between Canada and the Pacific was, in two points, impracti-

cable for a railroad. The most distinguished of these, Capt. John Palliser, of the Royal Engineers, speaking of the district between the western shores of Lake Superior and the Red River, says: "It is intersected by long, narrow lakes and innumerable water-courses, broken by ridges of rock, across which the traveler has to make tedious portages," etc. "As a line of communication with the Red River and the Saskatchewan, the canoe route from Lake Superior would, I consider, be always too arduous and expensive a route of transport for emigrants, and never could be used for the introduction of stock, both from the broken nature of the country passed through, and also from the very small extent of available pasture. *I therefore cannot recommend the Imperial Government to countenance or lend support to any scheme for constructing, or, it may be said,* FORCING, *a thoroughfare by this line of route, either by land or water*, as there would be no immediate advantage commensurate with the required sacrifice of capital; nor can I advise such heavy expenditure as would necessarily attend the construction of *any exclusively British line of road* between Canada and the Red River settlement." That is bad for the "exclusively British" on the east. Of the country on the west, Palliser says: "The knowledge of the country, on the whole, would never lead me to advocate a line of communication from Canada across the continent to the Pacific, *exclusively through British territory*. The time has now forever gone by for effecting such an object; and the unfortunate choice of an astronomical boundary line *has completely isolated the Central American Possessions of Great Britain from Canada on the east, and almost debarred them from any eligible access from the Pacific coast on the west.*"