

The Columbia River Nature's Great Highway

WHAT the Mississippi is to the Middle West and the Nile to the Nile to Egypt, the Amazon to South America, the Columbia is to the Northwest. It gathers into its huge channel the waters of the whole Northwest, except one small corner, and pours them through the gateway of the Cascades in such volume that, when they reach the ocean, they change its color for miles. By this fact this great river of the West, which had until then been a subject of vague rumor and travelers' tales, betrayed itself to Captain Gray and he carried the news to Boston, which led to its becoming the only fresh-water harbor on the Pacific Coast.

The Columbia has a watershed of 245,000 square miles, which includes the western slope of the Rocky Mountains, both slopes of the Bitter Roots in the United States and the Selkirk in British Columbia, both slopes of the Cascades and both slopes of the Coast Range. It is probably the only river in the world which drains both slopes of three ranges of mountains, cutting its way through them with relentless power in its struggle to reach the ocean. Of its drainage area 120,000 square miles are east of the Cascades, an area equal to that of New England, New York, Pennsylvania, New Jersey and Maryland combined.

The Valley of the Columbia is the main artery of commerce for the Oregon Country which Lewis and Clark explored. Eastwardly ships sailed to the Willamette to Portland, 110 miles from the ocean, and 212 miles of the river and its tributaries are navigable. It is the only river on the Pacific Coast navigable by seagoing ships, and it gives to Portland the only fresh-water harbor on the Coast. The opportunity to enter such a harbor is of great value to ships, for the action of fresh water cleans all barnacles and other marine growth from their bottoms.

But the Columbia serves also as the natural gateway for land transportation from the great agricultural intermountain country to the sea. Its valley furnishes the only water-level route for a railroad through the Cascade and Sierra Nevada Mountains between the Canadian and Mexican boundaries.

Portland is at the head of navigable water for seagoing ships in the Columbia Basin and is the terminus of the Oregon Railroad & Navigation Company's railroad through this great gap in the mountains. It is therefore the natural outlet to the ocean for the commerce of the interior and the natural inlet for imports from abroad. As Hamburg is to Germany, Liverpool to England, Glasgow to Scotland, Havre and France to the ocean, so is Portland to the Pacific Coast of the United States.

The importance of the Columbia as a water highway is thus described by Major C. F. Powell, of the Corps of United States Engineers:

The Columbia is the great river of the Pacific Coast. In volume and in commercial value, it is second only to the Mississippi. Its banks are more stable, its waters are clearer, its ice blockades are much less in duration than in the great waterway of the East. Unlike the Mississippi, the Columbia seeks the ocean in a line parallel to trade channels, and not at right angles to them.

SHIP CHANNEL UP RIVER.
Deep-Sea Ships Can Come Up to Fresh Water Harbor at Portland.

FROM the ocean to Portland, the Columbia and Willamette Rivers have been kept open to shipping by the Government, with the aid of the Port of Portland Commission, a body established by the State of Oregon for the purpose of maintaining an open channel, with powers to levy taxation within the area directly benefited.

At the mouth of the river the sands carried down by its waters and those drifting from the beach north and south have formed a bar, across which the Government maintains a ship channel. A jetty from Point Adams on the north has been extended 4 1/2 miles northwest. It forced the water into a single channel, which in 1866 reached a maximum depth of 31 feet at low water, but has since shoaled again to 22 feet. In order again to deepen the channel, the ocean-going dredge Grant has been at the mouth and the south jetty is being extended 2 1/2 miles, the purpose being to secure a permanent depth of 40 feet at low water in the bar channel. The dredging has already deepened the channel to 34 feet. If these measures should not prove effective, it is intended to construct a north jetty from Mackenzie Head across Peacock Spit for 2 1/2 miles in a southerly direction. This is expected to make a channel two miles wide and with a minimum depth of 40 feet, which is ample for the largest ships afloat.

By means of dredging and the building of dikes, a channel has been maintained from Portland to the sea, 23 feet deep at low water as far down as Slaughter's Bar, and 22 feet from there downward. Two dredges are employed in this work every summer, after the spring freshets are over, leaving a fresh deposit of silt, and they not only restore any shoals placed to their original depth but gradually increase the normal depth from year to year. With a tidal range from seven feet at the mouth to three feet at Willows Bar, just below the mouth of the Willamette, this gives ample depth for the largest ships afloat.

Portland's position as a port was shown in 1868, when the steamer Algon took the largest cargo of flour ever shipped from the Pacific Coast from Portland to Astoria in 72 hours. American warships have repeatedly come up to Portland without difficulty, and the port enjoys as low charter rates as any on the Pacific Coast. It has a harbor three miles long, where ships of the deepest draft can safely anchor in fresh water, the latter fact making it much sought after by shipmasters.

CELLO TO BOUNDARY.
Frequent Navigable Stretches Which May in Time Become Continuous.

PENDING the opening of navigation past the rapids between The Dalles and Celilo, little has been done towards opening the Upper Columbia. But a good beginning has been made, the subject has been studied by the United States Engineers, plans have been made and estimates of cost prepared. Steamers will no sooner have begun to traverse the channel than a demand will arise for a channel up the Snake to Huntington, 415 miles up the Columbia from the foot of Priest Rapids to the boundary, 252 miles. In time this demand will grow so loud that it cannot be ignored, and the whole inland empire of Oregon, Washing-



ton and Idaho will be traversed by great navigable waterways, which will force railroad rates down to their deep channel. The first part of this stretch which needs improvement is from the foot of Priest Rapids to the head of Rock Island Rapids, a distance of 11 1/2 miles. The three great rapids in this distance are formed by great masses of rock in a deep canyon, as well as by huge isolated rocks. They are navigable at some risk at high water, and the Government has reduced the dangers by blasting out some of the worst rocks, and by placing ringbolts and iron posts to aid boats in lining up Cabinet and Rock Island Rapids.

From the head of these rapids up to Wenatchee there is a good deep channel the year around, and from Wenatchee up to Foster Creek Rapids, just above the mouth of the Okanogan, the river is navigable at almost all times, the total distance from Rock Island being 90 miles. The upper part of this stretch has been greatly improved by the removal of rock at Rocky Beach and Methow Rapids, and the placing of ringbolts by which steamers can line up over the rapids.

THE COLUMBIA RIVER AND ITS TRIBUTARIES.

RIVERS AND SECTIONS OF RIVERS.	Navigable—miles	Navigable with difficulty or under favorable conditions—miles	Not navigable—miles
Columbia—			
Mouth to Willamette River.....	102		
Willamette River to The Dalles.....	88		
The Dalles to Celilo.....	198	13	
Celilo to Priest Rapids.....	57		11.5
Foot of Priest Rapids to head of Rock Island Rapids.....	57		
Rock Island Rapids to Wenatchee.....	67		
Wenatchee to mouth of Okanogan.....	65		
Mouth of Okanogan to Spokane Rapids.....	28	100	
Spokane Rapids to Riecky's Landing.....	62		
Riecky's Landing to Marcus.....	62		
Marcus to Robson, B. C.....	62		
Robson through Arrow Lakes to Arrowhead.....	124		
Arrowhead to Lower Lake.....	67		
Lower Lake to Big Bend.....	39		
Big Bend to Golden.....	33		
Golden to the source.....	100		
Totals for Columbia.....	867	16	287.5
Willamette and tributaries—			
Mouth to Portland.....	8		
Portland to Corvallis.....	120		
Corvallis to Eugene.....	20		
Yamhill River, mouth to McMinnville.....	17.5		
Long Tom River, mouth to Monroe.....	7		
Total Willamette.....	162.5	38	67
Snake and tributaries—			
Mouth to Riparia.....	98		150
Riparia to Astoria.....	67		
Astoria to Ballard's Landing.....	150		
Ballard's Landing to Huntington.....	67		
Clearwater, Lewiston to Kamiah.....	67		
Totals for Snake.....	350	200	100
Okanogan River—			
Mouth to Okanogan City.....	43		
Okanogan City to boundary.....	44		
Osoyoos Lake.....	6		
Osoyoos Lake to foot of Dog Lake.....	26		
Foot to head of Dog Lake.....	30		
Head of Dog Lake to Pentiction.....	60		
Pentiction to Okanogan Landing.....	60		
Totals for Okanogan River.....	117	44	29
Kootenai River—			
Canal Lakes to Jennings.....	159		
Jennings to Bonner's Ferry.....	180		
Bonner's Ferry to foot of Kootenai Lake.....	20		
Kootenai Lake, head to foot.....	25		
Foot of Kootenai Lake to Robson, B. C.....	25		
Totals for Kootenai River.....	254	189	75
Other tributaries—			
Clatskanie River.....	50		
Cowlitz River, mouth to ten miles above Toledo.....	50		
Lake Chelan, foot to Stehkin.....	18		
Spokane River, foot to Coeur d'Alene City.....	24		
Coeur d'Alene Lake, Coeur d'Alene City to head.....	24		
Coeur d'Alene River, mouth to Mission.....	22		
Pend d'Oreille Lake and River, Lakeview to Box Canyon.....	116		
Pend d'Oreille River, head of Box Canyon to mouth.....	67		126
Slocan Lake.....	23		
Total, other tributaries.....	392	30	126
Grand totals.....	1,873.5	676	607.5
Total length of Columbia and main tributaries below head of navigation, 2117 miles.			

ton and Idaho will be traversed by great navigable waterways, which will force railroad rates down to their deep channel. The first part of this stretch which needs improvement is from the foot of Priest Rapids to the head of Rock Island Rapids, a distance of 11 1/2 miles. The three great rapids in this distance are formed by great masses of rock in a deep canyon, as well as by huge isolated rocks. They are navigable at some risk at high water, and the Government has reduced the dangers by blasting out some of the worst rocks, and by placing ringbolts and iron posts to aid boats in lining up Cabinet and Rock Island Rapids.

RAPIDS OF THE COLUMBIA.
Government Will Dig Canal to Open Waterway to Interior.

THE next great stretch of the Columbia is that from the mouth of the Willamette to the Cascades a series of rapids at the point where the water has forced its way through the main backbone of the Cascade Mountains for a distance of four and one-half miles, 20 miles above the Willamette. This is navigable by river steamers at all times, and during the early days prior to the construction of the railroad down the south bank of the river was the chief means of communication with the East. At that time passengers came west by the Northern Pacific Railroad to Wallula, where they were transferred to steamers, which brought them down to Celilo. At that point they were again transferred to a portage railroad which carried them past the 13 miles of river which is obstructed by falls and rapids to the town of The Dalles, where they were again transferred to steamers for the journey to the Cascades. Another portage railroad carried them past that point, and then they made the rest of the journey by steamer to Portland.

but the latter part of the Okanogan has been obstructed with rapids until recent years, during which the Government has been blasting out rocks, dredging bars and building winddams, which have deepened the channel by two feet. When this work is finished the Okanogan will be navigable to the boundary at all stages. Thence northward it is a comparatively shallow, swift stream, but it widens out on the boundary into Osoyoos Lake, six miles long, and further north, in British Columbia, into Dog Lake, eight miles, and Okanogan Lake, 20 miles long, all of which are navigable.

The government is now engaged in opening the whole river to navigation beyond the mouth of Snake River to the foot of Priest Rapids, 29 miles above the mouth of the Willamette. By this means the whole interior of Oregon, Washington and Idaho will be given the benefits of water transportation for their products to the sea, which will pour through this natural gateway to Portland, their natural outlet.

Of this great undertaking, half has been completed already, namely, the construction of a canal and locks the Cascades at a cost of \$4,000,000. There are two locks of solid masonry, each 462 feet long, and the total length of the canal and locks combined is 2000 feet, capable of accommodating steamers of eight feet draft.

The stretch of open river to which the locks lead ends at Three-Mile Rapids, the first of a series of rapids, of which the first is the Dalles, a narrow trough between walls of basalt 150 to 200 feet apart, through which the river rushes with great velocity for a mile and a half. Then comes Ten-Mile Rapids, a similar gorge of one-third the length, and just is Celilo Falls, where the water drops a sheer 20 feet. The length of this series of obstructions is 20 miles, and that distance the river has a total fall of 60 feet.

The Government has decided to make navigation continuous past these obstructions by the construction of a canal on the Oregon shore at a cost of about \$4,000,000, on condition that the necessary land is given without cost. The State has secured the right of way by gift or purchase, and deeded it to the United States, and the beginning of work only awaits the approval of the deeds by the law officers of the Government.

But the people of Oregon are not content to await the completion of this stupendous task to secure the benefits of cheap transportation which they would gain from an open river. Before Congress had taken decisive action on the canal, the State Legislature had made an appropriation for the construction of a portage railroad, and this not proving enough, the Open-River Association has raised money by subscription among the people directly interested. There is every reason to believe that the year 1905 will see the completion of this railroad, after which the people of Oregon will witness the completion of the canal, which is expected to occupy ten years.

SECOND GREAT FEEDER.
Snake Admits Steamers to Interior of Oregon and Idaho.

NEXT to the Willamette, the Snake is the greatest tributary of the Columbia. Rising in the southern part of the Yellowstone National Park, it drains an area of 104,000 square miles in a course of 300 miles. It is navigable at high water from its mouth to Riparia, a distance of 67 miles, and Government engineers have recommended the improvement of that section at a cost of \$150,000, so as to give a depth of five feet at low water and make it navigable all the year round. The next stretch of 73 miles from Riparia to Lewiston, at the mouth of the Clearwater, is navigable for light-draft steamers all the year round, and the Government has been steadily improving it by blasting out rocks at the many rapids, scraping and dredging the bars and building dikes at Log Cabin Rapids and Wild Goose Island, which have conspired to slow the flow of water in a single channel. This improvement has been extended up to Astoria, at the mouth of the Grand Ronde River, 25 miles beyond Lewiston, and there is now a navigable channel at all times for boats of 4 1/2 feet draft.

The 150 miles of the river from Grand Ronde to Ballard's Landing is so obstructed by rocks and rapids as to be impracticable for navigation at any time, but from the latter point, which is in the fast developing mining district of Seven Devils to Huntington, 75 miles further up, there is a stretch of water navigable at high water, from which the Government began the removal of rocky obstructions and placing ringbolts and iron posts to aid boats in lining over the rapids, but the absence of traffic to use the improvement has caused its suspension as far as Astoria would be so easily effected that Congress would doubtless clear the way for it immediately on the opening of the Dalles-Celilo Canal. This done, steamers would try to force a way through the canyon to Ballard's, and the Government engineers would be called upon to solve the problems of the rapids. After that, the creation of a canal at all seasons from Ballard's to Huntington would be a simple matter.

The Clearwater Valley, of Idaho, enjoys the same water transportation facilities based on it, will certainly follow in a few years the construction of the portage railroad and Dalles-Celilo Canal on all the system of rivers, which covers Northwestern Oregon, Southern Washington and Southwestern Idaho.