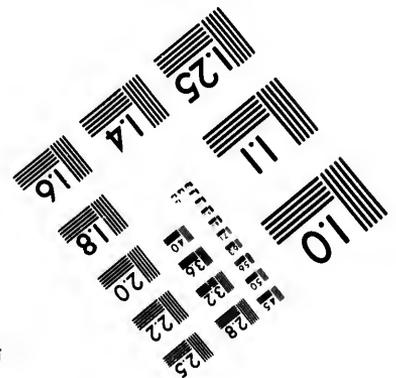
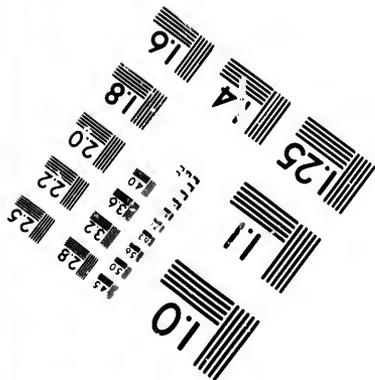
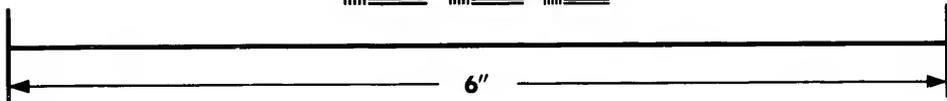
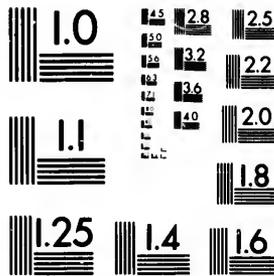


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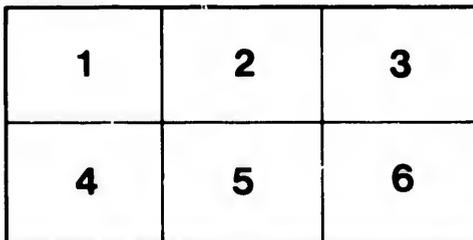
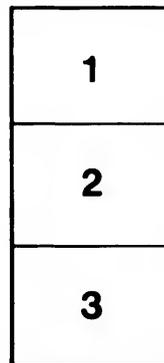
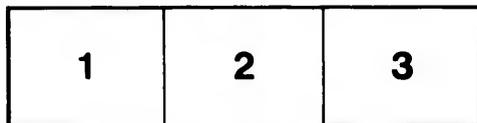
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POSSIBILITIES OF THE GREAT NORTHWEST.

BY S. A. THOMPSON.

[Although the last of our large government tracts of land has been parceled out for settlement, homeseekers need not despair. In the Great Northwest there are still to be found thousands of acres of unoccupied fertile field. Last month we called attention to the undeveloped resources of this vast domain, and in this number we have the good fortune to be able to present an article by Mr. S. A. Thompson, who sets forth in facts and figures its wonderful possibilities. As Secretary of the Duluth Chamber of Commerce, Mr. Thompson has for a number of years been actively engaged in seeking out and pushing forward effective means for bringing the Northwest into closer communication with the rest of the American Continent, and he is, therefore, able to write with an intimate knowledge of his subject. Dr. Johnson, whose article "Inland Waterways for the Northwest" well supplements that of Mr. Thompson, is Lecturer on Transportation in the Wharton School of Finance and Economy, University of Pennsylvania, and has recently given to the public a monograph on the subject of "Inland Waterways."—THE EDITOR.]

"I RESPECTFULLY recommend that the post be abandoned, for the reason that the surrounding country is of such a character that it is impossible that it can ever support a sufficient population to justify the expense necessary to maintain a fort at this point." Thus, in substance, wrote the officer in command of Fort Dearborn to the Secretary of War in 1823. And dreary enough, no doubt, was the situation of the forlorn little outpost of civilization from which he wrote. The population of the United States was less than thirteen millions; permanent settlement had scarce extended west of the Mississippi at any point, the one notable exception being a narrow strip on either side of the Missouri, reaching from St. Louis to the present site of Kansas City. Iowa, Nebraska, Minnesota and the Dakotas were not even dreamed of, but were still a part of the Territory of Missouri. The rude stockade, called by courtesy a fort, stood in a vast malarious swamp, through which a sluggish stream crawled slowly down to join the waters of a lake on which no sail was ever seen. Westward for uncounted leagues there stretched a wilderness almost unknown, and peopled only by savages.

SEVENTY YEARS LATER.

Not for the reason given by the officer in charge, but for others as different as is day from night, the little fort upon the far frontier has been abandoned. In its stead there stands a splendid city, home of more than fifteen hundred thousand souls, trade mistress of an empire in extent more vast than that which bowed in ancient days beneath the yoke of Rome. Westward lie a score or more of sovereign States, and prosperous towns and cities by the hundred dot the level plains and nestle in the mountain valleys which lie between the waters of Lake Michigan and the blue Pacific. Most wonderful of all is that city within a city which stands beside the inland sea—the marvelous White City—which has risen from the shifting sands as if by touch of some enchanted wand. Within its walls there have been placed the choicest fruits of forest, field and mine, the triumphs of science and of art, all that is best and highest in human achievement, gathered from every tribe and nation on the earth—the greatest exposition of the progress of the race the world has ever seen.

And all these wonders have been wrought by and in a city which but seventy years ago lay all undreamed of in the womb of Time.

Such was the pessimistic prophecy in 1823, and thus has fate made answer in 1893.

THE GREAT NORTHWEST.

Before the possibilities of the Great Northwest can be intelligently discussed some understanding must be had as to the territory meant to be designated by that term, since no authoritative and universally accepted definition has yet been formulated. For the purpose of this article the Great Northwest will be considered to include, first, the American Northwest, consisting of the States of Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Montana, Wyoming, Idaho, Washington and Oregon; second, the Canadian Northwest, consisting of the provinces, present and prospective, of Keewatin, Manitoba, Assiniboia, Saskatchewan, Alberta, Athabasca, Mackenzie and British Columbia; and third, of the American Territory of Alaska.

THE AMERICAN NORTHWEST.

It is doubtful if the average American has any adequate conception of the enormous size of the Northwestern States of the Union. Taken together they contain an area of 859,325 square miles, as appears from the following table:

Minnesota	83,363
Iowa	56,025
North Dakota	70,795
South Dakota	77,650
Nebraska	77,510
Montana	146,080
Wyoming	97,800
Idaho	84,800
Washington	69,180
Oregon	96,030
Total	859,325

It is probably just as doubtful if the average American has any adequate conception of what these figures really mean after they have been stated, but a few comparisons may aid in giving the reader a clearer understanding both of their import and their

importance. St. Louis County, Minn., lacks but a trifle of being as large as Connecticut and Rhode Island combined. Minnesota is more than ten times as large as Massachusetts, and Montana is three times as large as New York. There are four counties in Wyoming, each of which is larger than either Vermont, Massachusetts or New Jersey, and three counties in Montana, each of which is larger than those three States combined.

The ten States which constitute the American Northwest are larger by 12,710 square miles than all the States lying east of the Mississippi river, and between the Great Lakes and the Gulf of Mexico, with the exception of Maine. Such illustrations might be multiplied *ad infinitum*, but those which have been given must suffice.

It is, of course, impossible to go into details in dealing with so vast a region. Volume after volume might be written concerning each one of the ten

States named, and in the narrow compass of a magazine article only generalizations of the broadest kind can be employed. The eastern half of the territory comprised in the ten States under consideration is a vast alluvial plain, having an average elevation at its eastern edge of about 1,000 feet above the sea, rising steadily higher toward the west, until it breaks into the foothills, and then leaps skyward to the snow-clad summits of the Rocky Mountains. Such local elevations as the Vermillion Range in Northern Minnesota, or even the Black Hills in South Dakota, while important enough when considered by themselves, are insignificant when compared either with the almost continental sweep of the plain from which they rise, or with the mighty uplift of the Rocky Range which lies beyond. Minnesota might be aptly named the "Mother of Waters," for from her borders the waters flow southward to the Gulf, eastward to the Atlantic and northward to Hudson's Bay. Wyoming is the "Dome of the Continent," for from amid her maze of mountains the waters run north, and east, and south and west. Beyond the Rockies are other mighty ranges running approximately parallel and having great valleys and lofty table lands between, and then—the broad Pacific.

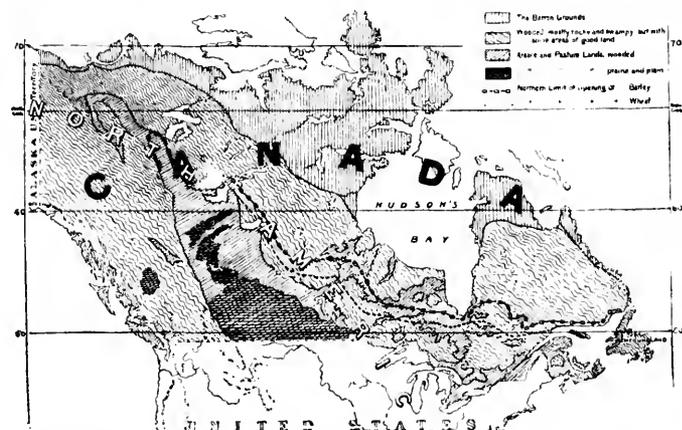
THE CANADIAN NORTHWEST.

An effort has been made by some comparisons to aid the reader to understand the immensity of the American Northwest. But if it be difficult for the average reader to comprehend the vastness of this portion of his own country, it is still more difficult for him to get an adequate understanding of the almost illimitable area of the Canadian Northwest. Few persons realize that before the purchase of Alaska Canada was larger than the United States, but such is the fact, for the territory of the Dominion is 3,470,392 square miles, while that of our country was but 3,025,600. The area of the ten Northwestern States, as has been shown above, is but 859,235 square miles, while the area of the organized provinces and districts (corresponding to our States and Territories) of the Canadian Northwest aggregates 1,245,305 square miles, as appears from the following table:

Manitoba.....	78,000
Kewatin.....	400,000
Assiniboia.....	95,000
Saskatchewan.....	114,000
Alberta.....	100,000
Athabasca.....	122,000
British Columbia.....	341,305
	1,245,305

This is nearly fifty per cent. greater than the area of the American Northwest, but still beyond these provinces and districts lies an unorganized territory with an area of more than sixteen hundred thousand square miles. But area is not the only thing to be considered and the reader must be left to struggle for himself with the meaning of these almost incomprehensible figures.

The Canadian Northwest falls naturally into three great divisions. The territory lying between Hudson's Bay and the great chain of inland lakes in the valley of the Mackenzie River, extending from Lake Superior to the Arctic Ocean, is wooded, mostly rocky and swampy, but with some areas of good land, merging finally into what are known as the barren grounds in the extreme northeastern portion, northwest of Hudson's Bay. Second, the great stretch of fertile plains, part prairie and part wooded, lying between the great lakes above mentioned and the Rocky Mountains and extending from the international boundary line almost to the Arctic Ocean.



MAP SHOWING BARREN GROUNDS, ARABLE AND PASTURE LANDS AND NORTHERN LIMITS OF THE POSSIBLE CULTIVATION OF BARLEY AND WHEAT.

States named, and in the narrow compass of a magazine article only generalizations of the broadest kind can be employed. The eastern half of the territory comprised in the ten States under consideration is a vast alluvial plain, having an average elevation at its eastern edge of about 1,000 feet above the sea, rising steadily higher toward the west, until it breaks into the foothills, and then leaps skyward to the snow-clad summits of the Rocky Mountains. Such local elevations as the Vermillion Range in Northern Minnesota, or even the Black Hills in South Dakota, while important enough when considered by themselves, are insignificant when compared either with the almost continental sweep of the plain from which they rise, or with the mighty uplift of the Rocky Range which lies beyond. Minnesota might be aptly named the "Mother of Waters," for from her borders the waters flow southward to the Gulf, eastward to the Atlantic and northward to Hudson's Bay. Wyo-

Third, the Alpine region extending from the Rocky Mountains to the Pacific Coast. As has been said by Mr. Erastus Wiman, in "The Greater Half of the Continent:" "In Canada, including the great lakes which encircle it and which penetrate it, and the rivers of enormous size and length which permeate it, is found more than one-half of the fresh water of the entire globe." There are more than ten thousand miles of navigable rivers in the Canadian Northwest—navigable, that is, not merely by canoes, but by steamboats. The supplies for all the posts of the Hudson's Bay Company are carried by water from Winnipeg even to points beyond the Rocky Mountains and the Arctic Circle, and the aggregate land transportation over the portages is only one hundred and fourteen miles. It is possible to go by water from the mouth of the St. Lawrence through the great lakes and down the Mackenzie to the Arctic Ocean, a trip of more than six thousand miles, in which less than one hundred and fifty miles will necessarily be on land. The great lakes of the Canadian Northwest are second in size only to the largest of the great lakes on the international boundary. Great Bear Lake is one hundred and fifty miles in length; Athabasca Lake, two hundred and thirty; while the Great Slave Lake is more than three hundred miles long and has an average width of fifty. The Mackenzie river is described by Archbishop Clut as a deeper, wider and grander river than the St. Lawrence, and it furnishes with its tributaries more than twenty-five hundred miles of navigable waters.

ALASKA.

Alaska, the third and last division of the Great Northwest, has an extreme length from north to south of eleven hundred miles. The most westerly point of the mainland is twenty-five hundred miles west of San Francisco, and the most westerly island of the Aleutian chain is more than thirty-five hundred miles west of that city. Its area is 577,390 square miles, of which 28,890 is insular, and it has a total coast line, including islands, of 26,364 miles. The southern coast is mountainous. The highest mountain on the coast is the great volcano, Mount St. Elias, which marks the turning point in the boundary between British and American territory. The principal feature is the valley of the Yukon, one of the great rivers of the world, which rises in British Columbia and, after a course of two thousand miles in a general westerly direction, falls into Bering Sea. The northern and western coasts are low, and the immediate valley of the Yukon for more than a thousand miles from the sea has an elevation of less than six hundred feet. The river is navigable in the summer for this distance by small steamers to Fort Yukon, which lies just upon the Arctic circle. More than two-thirds of the territory is still unexplored for scientific and economic purposes, and it is mainly the coast that is known.

A STORY AND A MORAL.

It is stated that upon one occasion a traveler, who had been hospitably received by a dusky monarch in

the heart of Africa, entertained his host with stories of the railway, the steamboat and all the wonders which the white race has achieved. All went well until it occurred to him to say that at certain seasons of the year in the white man's country all the lakes and rivers grow solid on the top, so that the king's elephants could walk across and would not wet their feet. "I have believed all you have said so far," said the angry king, "although you have told me many wonderful things, but now I know you are a liar!" All the Africans, from Tripoli to Zululand and from Sonali to Soudan, would have sustained the king's opinion had they been appealed to, and would have joined vociferously in the cry of "liar!" which he raised. Yet none the less the traveler's tale was true. The moral of this story is that a statement is not necessarily false because it is contrary to all the knowledge and experience of an individual or a race. This moral is earnestly commended to the careful consideration of the reader who shall peruse the facts which follow.

WHERE WHEAT CAN BE GROWN.

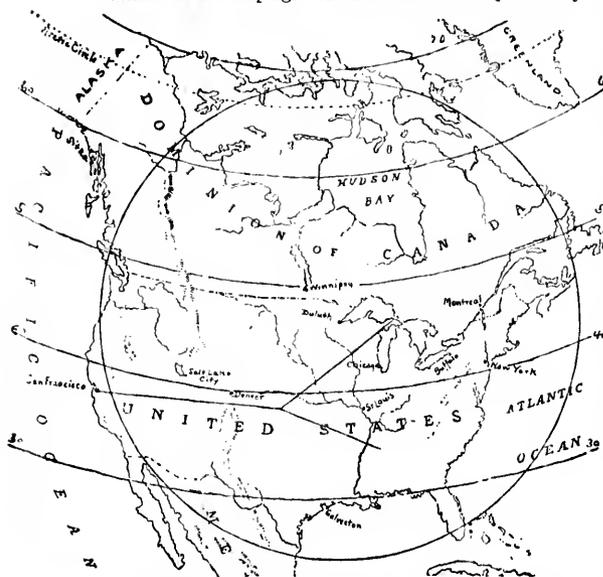
To the people of the Eastern States the city of Duluth, no doubt, seems very far away to north and West—almost, indeed, upon the very verge of possible settlement; but, as a matter of fact, the limit of the profitable cultivation of wheat lies at least sixteen hundred miles to the northwest of the city at the head of Lake Superior. If a circle be drawn upon a map of North America, with this distance as a radius and with Duluth as the centre, it will include within its sweep a portion of the Arctic Sea upon the north, half of the Gulf of Mexico upon the south, and all of Washington and part of California upon the west, touch Newfoundland on the east and fall five hundred miles into the Atlantic Ocean beyond the city of New York. Rye and oats can be grown at least two hundred miles still further north, while the possible limit of the ripening of barley and of potatoes lies beyond the Arctic circle, full two thousand miles northwest of Duluth.

CLIMATIC CONDITIONS.

It is the general idea that the further north one goes the colder the climate, but in the Great Northwest, from Iowa north to the Peace River Valley, and even on to the shores of the Great Slave Lake, a range of nearly twenty degrees of latitude, climatic conditions are essentially the same. It is a region marked by great heat in summer and intense cold in the winter. Many illustrations might be given to show this similarity of climatic conditions over such a wide extent of territory, but one or two must suffice. Hon. J. W. Taylor, who for nearly a quarter of a century prior to his recent death had been the consul of the United States at Winnipeg, and to whom I am indebted for many of the facts contained in this article, says: "The prairie's firstling of the spring has the popular designation of crocus, but it is an anemone—*A. Patcas*, the purple anemone, the 'win' flower—but I prefer the children's name, suggested by its soft, furry coat, the 'gosling' flower, which,

with its delicate lavender petals, is fully ten days in advance of other venturesome spring blossoms. It is often gathered on the Mississippi bluffs near the Falls of St. Anthony on April 15. It appears simultaneously on the dry elevations near Winnipeg. It was observed even earlier, on April 13, during the Saskatchewan campaign of 1885, and is reported by

altitude in northern lands. The great central plain of North America is two miles high in Mexico. The entire Colorado basin has an average height which is greater than that reached by the Great Northern Railway where it crosses the main divide of the Rocky Mountains near the international boundary line. The Union Pacific crosses the dome of the continent near latitude 40° with its highest elevation at Sherman of eight thousand feet, and with an average elevation of five thousand feet for fifty miles eastward from the Rocky Mountains. It is higher for thirteen hundred miles of its course than any point between the Atlantic and Pacific on a surveyed route through the Peace River country. The elevation at the crossing of the Canadian Pacific Railway on the south branch of the Saskatchewan near latitude 51° is but three thousand feet; in the Athabasca district, latitude 55°, is two thousand feet; the valleys of the Peace and Liard rivers, latitude 56° to 60°, is but one thousand feet; and falling still toward the north, the navigable channel of the Mackenzie River is reached at an elevation of only three hundred feet above the Arctic Ocean. The difference in the altitude of the continental plain in Wyoming and in the valley of the Mackenzie River is equivalent in its climatic effect to 13° of latitude. But the climatic conditions of the Great Northwest do not depend alone upon latitude and altitude.



The straight lines on this map define three territories, all points in one of which are nearer to Duluth than to Chicago or Galveston; all points in the second nearer to Chicago than to Duluth or Galveston; and all points in the third nearer to Galveston than to Duluth or Chicago.

Major Butler in his 'Wild North Land' as in profusion on Peace River, 1,500 miles from St. Paul, on April 20. Even beyond one thousand miles, on the Yukon, within the Arctic circle, Archdeacon McDonald, a missionary of the Church of England, has gathered the flower on May 14. Equally significant as this delicate herald of the spring are the records of ice obstruction in the rivers, their emancipation being simultaneous from Fort Snelling, Minnesota, to Fort Vermilion, Athabasca."

ALTITUDE VS. LATITUDE.

The recorded observations of many years confirm the truth of these statements, but it will be in order to state some of the reasons for this similarity of the climate over so wide a range, with the far northwestern extension of the growth of wheat and other cereals which the existence of these conditions renders possible. Latitude has something to do with climate, but not everything. Altitude is at least as important. The effect of altitude in overcoming the influence of latitude is shown by the mountains crowned by snow which lie within the tropics. This fact is known to every one, but few have given consideration to the reverse effect produced by the decline of

OCEAN CURRENTS AND PACIFIC WINDS.

The great Japan current sweeping northward from the island kingdom to the Arctic Sea, is caught by the Aleutian Archipelago and the Alaskan peninsula and deflected to the east and south along the shores of Alaska, British Columbia and the States of the Pacific Northwest, producing effects exactly similar to those caused by the Gulf Stream upon the climate of Norway and the British Islands. A large portion of the Pacific Coast of North America has, instead of winter and summer, a rainy season and a dry season, after the fashion of tropical lands. Even as far north as Sitka, it is said that ice sufficiently strong to sustain the weight of a twelve year old boy occurs but once or twice in a generation. The ameliorating influence of this great warm river of the sea, while exerting its greatest effect upon the coast, extends also into the interior. The mountain barriers are not only far less lofty in the north, but are less in width. As has been said, the Union Pacific crosses the Rockies at an elevation of 8,000 feet; the Great Northern at an elevation of but 5,300 feet; the Canadian Pacific, still further to the north, at an elevation of a little over four thousand feet; while the passes of the Peace and Pine rivers have an elevation of but twenty-five hundred feet above the sea level. The Rocky Mountains in Colorado are nearly twenty degrees away from the coast line, while in the Peace River country they stand but ten degrees away, and these degrees, it must also be remembered, are shorter because of the higher latitude. "The Utah basin, a plateau eight hundred miles or more in width, at an elevation of five thousand feet, lying between the Rocky Mountains and the

Sierra Nevadas, making a total mountain barrier of fourteen hundred miles, excludes the warmth and moisture of the Pacific winds from the central areas of the continent, while the interlocking valleys of the Columbia and the Missouri on the route of the Northern Pacific Railroad, and of the Frazer and Columbia Rivers and the Saskatchewan on the route of the Canadian Pacific, facilitate the ingress of the Chinook, as the warm western wind of the Pacific Coast is called, to the plains of Montana, Alberta and Saskatchewan. But it is only in latitude 55° to 56° that the remarkable condition is found of the Peace and Liard rivers, rising on the western slopes of the Rocky Mountains, and breaking through this barrier on their way to the Mackenzie, after interlocking at their sources with the Skesna and the Stikkeen, which flow into the Pacific."

ANOTHER EXPLANATION OF THE CHINOOK.

It is objected by some that the lower elevation of the mountain barrier and the passes through the same is not sufficient to explain the occurrence of the Chinook upon the plains to the east of the mountains. The writer has observed the effect of this wind as far east as the James River Valley in North Dakota, where upon one occasion he saw eighteen inches of snow utterly vanish in thirty-six hours without previous melting, and without leaving a trace of mud behind. It was simply licked up by the tongue of the wind and carried away into the air. At the same time there were hundreds of miles of snow-covered mountains to the west over which this wind had

blown on its course from the Pacific and upon which the snow remained unmelted. Dr. G. M. Dawson, of the Canadian Geological Survey, says: "The complete explanation is to be found in the great quantity of heat rendered latent when moisture is evaporated or air is expanded in volume, but which becomes sensible again on condensation of the moisture or compression of the air. The pressure in the upper regions of the atmosphere being so much less than in a lower, a body of air rising from the sea level to the summit of a mountain range must expand, and this, implying molecular work, results in an absorption of heat and consequent cooling. When the air descends again on the other side of the mountain range its condensation results in an increase of sensible heat equal to one degree Centigrade for each hundred meters. It thus becomes easy to understand how the Western Territories may be flooded with air nearly as warm as that of the coast, though it has traveled to them over a region comparatively cold." The explanation of the Chinook, whatever it may be, is of much less importance than the fact of its existence.

GREATER LENGTH OF DAYS.

Light, by the chemical action which it produces, is scarcely less important than heat in the growth of vegetation, and in these far northern latitudes the days are very much longer than they are further south. In latitude 56 degrees, which may be taken as the average of the Peace River country, sunrise occurs on June 20 at 3.12 A.M., and sunset at 8.50 P.M., being a difference in the length of day-



PLOUGHING NEAR GRISWOLD, MANITOBA.

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A WHEAT FARM NEAR REGINA, ASSINIBOLA.

light of two hours or more as compared with points in Iowa and Nebraska. To this is at least partly due the wonderful rapidity with which vegetation advances. At Fort Simpson, at the junction of the Liard and Mackenzie rivers, Archbishop Clui speaks of the trees passing in a single week from bud to perfect leaf, and grasses, grains and vegetables of all kinds mature throughout the Northwest in a much shorter time than in the regions further south. As an instance it may be pointed out that Indian corn is harvested from three to five weeks earlier in Minnesota than it is in the Ohio Valley.

MAXIMUM OF FRUCTIFICATION.

In the Great Northwest, the region of vigorous winters, cold, moist springs and dry but intense summers, the undue luxuriance of stem and foliage is checked in the earlier stages of growth, greatly to the advantage of the fruit and seed. This vigor given to vegetation in cold climates by the rapid increase and prolonged action of summer heat has been well formulated by Dr. Samuel Farry in an article on "The Acclimating Principle of Plants," published many years ago in the *American Journal of Geology*. He states as a universal fact that the cultivated plants yield the greatest product near the northernmost limit at which they can be grown. His illustrations include nearly every plant known to commerce and used either for food or clothing. Cotton is a

tropical plant, but yields the best staple in the temperate latitudes. In the rich lands of the Middle States corn will often produce 50 or 60 bushels to the acre, but in New York and New England agricultural societies have awarded prizes for yields of 125 bushels to the acre. The Irish potato comes to full perfection only in northern latitudes or cool moist insular situations, as in Ireland. In the South the sun forces the potato on to fructification before the roots have had time to attain the proper qualities for nourishment. As a further illustration Consul Taylor cites the fact that in Iowa, near the southern border of the spring wheat region, seldom more than two well-formed grains are found in each cluster or fascicle forming the row; in Northern Minnesota, Dakota and Manitoba three grains become habitual, while in wheat from Prince Albert on the Saskatchewan, and Fort Vermilion on the Peace River, each cluster is made up of five well-formed grains. Space is lacking for a discussion of the possibilities which lie in the gradual acclimatization of plants, but it may be pointed out that in Siberia, where conditions are certainly no more favorable than in the Northwest, civilized man, in his migrations northward, has carried with him apples, pears, cherries and plums, until these fruits are successfully grown at and beyond the latitude of Moscow, which lies six degrees north of Winnipeg.

EXPERIENCE CORROBORATES THEORY.

Proctor Knott in his famous speech on Duluth in 1871, said: "Who will have the hardihood to rise in his seat on this floor and assert that, excepting the pine bushes, the entire region would not produce vegetation enough in ten years to fatten a grasshopper?"

In 1891, twenty years after these derisive words were uttered, Minnesota, the two Dakotas, Iowa and Nebraska produced, according to the estimates of the Agricultural Department, 182,818,000 bushels of wheat, 561,835,000 bushels of corn and 243,226,060 bushels of oats, a total of 987,879,000 bushels of the three

for each of the grains named, of the average yield per acre south of the boundary line. Nor must we depend upon theorizing alone as to the possibilities of the far Canadian Northwest. Lying upon the table in front of me as I write are samples of wheat grown in 1892 by the Rev. J. Gough Brick at the Shaftesbury Mission, six miles north of the junction of the Peace and Smoky rivers, in the neighborhood of 56° north latitude and 117° 30' west longitude. One specimen was sown on the May 10, reaped on August 28, and yielded 34 bushels to the acre of large, plump, blinty berries, weighing 65½ pounds to the measured



FRUIT FARM NEAR HARRISON, BRITISH COLUMBIA.

principal cereals, of an estimated value of \$363,516,364. These figures are interesting standing alone, but become still more interesting by comparison with the total production of the same crops in the United States, for the yields above mentioned constituted 30 per cent. of the wheat, 27 per cent. of the corn and 33 per cent. of the oats grown in the whole country. If to this could be added the value of all other farm and dairy products, the figures would be almost incomprehensible. Crossing the line into Manitoba, productivity seems to be increased rather than diminished, for the prairie province produced in 1890 14,665,769 bushels of wheat, 9,573,433 bushels of oats and 2,069,415 bushels of barley. These totals seem small when compared with those given for the five States above named, but the point lies in the fact that the yield per acre in Manitoba was largely in excess,

bushel. Similar results are reported from other mission stations and posts of the Hudson's Bay Company throughout the great Canadian Northwest, extending for 2000 miles or more to the north and west of Lake Superior.

OTHER RESOURCES.

So much space has been given to the agricultural possibilities of the great Northwest that in the little which remains only the barest mention can be made of the almost boundless resources in other directions which are found therein.

West of the great belt of wheat country is an enormous area not so well adapted to the production of cereals, but admirably suited for the raising of cattle, horses and sheep. Doctor J. B. Hurlbert, M.D., LL.D., of Ottawa, says in regard to this:

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CATTLE HERDING.—RANCHING SCENE IN ALBERTA.

grasses grow over the whole country, even to the shores of Hudson's Bay and the Arctic Ocean, and down the Mackenzie to the sea, and all the region in the valley of the Mackenzie and its tributaries is fit for the production of the summer grass, with the usual exception of mountainous regions and of rocky or low damp soils, but these are not large, the country being chiefly contained in the flows of the great washes. Through all the country east of the

Great Lakes of the Mackenzie River system the grasses are like our June grass and the blue grass of Kentucky. The Dominion embraces the chief pasture and meadow lands of North America, and these with their accompanying flocks and herds, are of more importance than wheat lands."

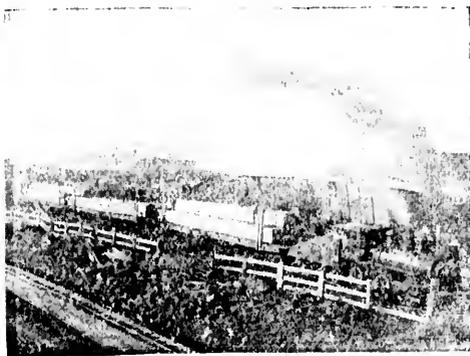
Over all the plains south of the Great Slave Lake buffalo roamed in countless millions in days gone by. One peculiarity of the grasses of that region is that they cure naturally upon the stalk. In nutritious qualities the buffalo grass is equivalent to a combination of Kentucky blue grass and oats, and the horses and cattle of these Northwestern plains will turn, with a contemptuous sniff, from the finest cultivated hay placed before them in the manger, and go outside to paw away a foot or more of snow, and eat their fill and fatten on the sweet grass lying underneath.

FOREST RESOURCES.

Only the barest mention can be made of the boundless forests of the Great Northwest. The northern limit of trees is found far beyond the Arctic circle, in the islands beyond the mouth of the Mackenzie. Banksian pine 2 feet in diameter is found on the



BIG TREE, STANLEY PARK, VANCOUVER.



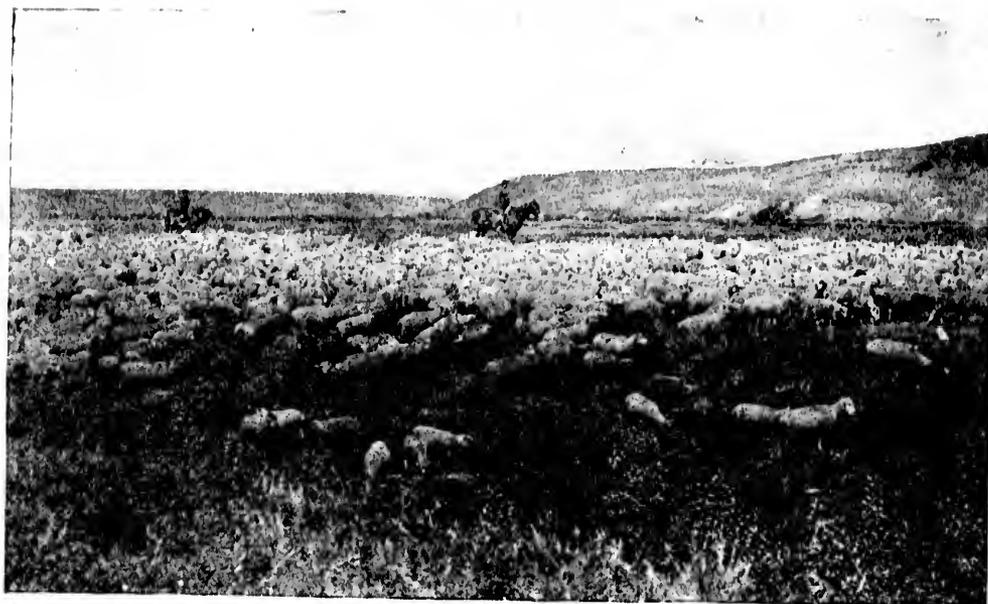
LUMBER SCENE IN BRITISH COLUMBIA.

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RANCHING SCENE IN ALBERTA.



DAIRY CATTLE, KENMORE, ALBERTA.

southern shores of Hudson's Bay. Fort Simpson was built of timbers 12 inches square, cut from the neighboring forests, and the smaller trees were chosen, that they might not be too heavy for convenient handling. Competent judges estimate the amount of timber standing in Northern Minnesota at 30,000,000,000 feet, while in Washington and British Columbia are to be found Douglas fir reaching a height of 300 feet and squaring 45 inches for 90 feet from the base, and red cedar 200 feet high and as large as 20 feet in diameter.

MINERAL RESOURCES.

In a territory so vast and so little explored it is not likely that a thousandth part of the mineral riches are known, much less worked. Northern Minnesota



GOLD WASHING, YALE, BRITISH COLUMBIA.

contains two of the greatest iron ranges in the world. There is said to be more than 100,000,000 tons of high grade Bessemer ore in sight in mines already opened on the great Mesaba range— ore which is being mined in some cases with a steam shovel, and placed aboard the cars at a cost of less than 10 cents per ton. Washington is called the Pennsylvania of the West because of her treasures of iron and coal, and in Montana, too, iron and coal and limestone lie close together, ready for consumption. The coal area of the Canadian Northwest is estimated at 65,000 square

miles, with from 5,000,000 to 9,000,000 tons under each mile. It ranges in quality from lignite to bituminous and anthracite. Coal is mined and delivered to customers at Edmonton for \$1.75 per ton. Deposits of great size and fine quality are being worked at Lethbridge, in Alberta, a short distance north of the Montana line, to which point a railroad has been built, southwesterly from the Canadian Pacific and northward from Great Falls in Montana. Fuel will be in no wise lacking for future settlers in the Great Northwest.

Montana is chief among the States of the Union in the value of the output of her mines of gold, silver and copper. The tangled mass of mountain ranges of which British Columbia consists is scamed through and through with veins of precious metals. More than \$3,000,000 of gold alone has already been taken from her mines. All the mountain ranges are full of the precious metals, even to far-off Alaska. Mines of gold are worked also on the Lake of the Woods, lying between Minnesota and Manitoba. Salt, sulphur, asphalt and petroleum, metals and minerals of every kind and sort lie beneath the soil, waiting the needs of the coming millions who shall one day make the Great Northwest their home.

FISHERIES AND FURS.

Every lake and river in the Northwest, and all the waters bordering upon its thousands of miles of sea coast, are teeming with myriads of fish. The greatest salmon cannery in the world is in Alaska, the Yukon River being so full of both red and king salmon, the latter reaching the length of 6 feet and a



AN EVENING CATCH, PHENIX CANNERY, FRAZER RIVER.

weight of 120 pounds, that it was not a very serious exaggeration when it was said that one might walk across the river on their backs. The yield of the fisheries in British Columbia alone in 1890 was \$3,481,432.

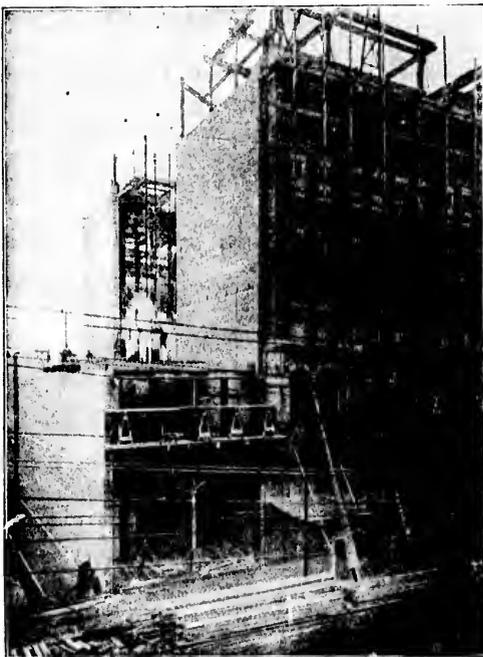
Latitude 62 degrees may be taken as approximately the northern limit of profitable agriculture. Beyond this is a vast region, which, while not adapted to set-

lement and cultivation, will probably be in all the future, as it has been in the past, a never failing source of supply of the choicest furs, a monopoly in the trade of which has made colossal fortunes for the members of the Hudson's Bay Company.

There is a possible source of immense wealth also in the breeding, and complete or partial domestication, of the reindeer and other animals which can furnish a supply of food, skins and other materials adapted to the use of man.

A HEALTHFUL COUNTRY.

Much has been said above in regard to climate in its relation to agriculture; a word may not be out of place as to its effect upon humanity. It is a healthful country. In Minnesota 70 per cent. of the yearly measure of heat, 76 per cent. of the rainfall and 76 per cent. of atmospheric humidity belonged to the season of vegetable growth. There is an average of more than 200 clear days to the year. Malaria is utterly unknown. And in the crisp, clear, invigorat-



LAYING BRICK TWENTY DEGREES BELOW ZERO.

ing, almost intoxicating atmosphere of the winters there is not a tithe of the physical discomfort which is found in the East. Moisture has as much or more than temperature to do with the physical effects of climate, whether it be hot or cold. In the Northwest work is not suspended in the winter; even building operations go on almost the same as in summer time. Many of the principal buildings of Duluth and other Northwestern cities have been built during winter,

and our illustration shows bricklaying going steadily on when the temperature was 20 below zero. Alternate freezing and thawing will, of course, destroy the temper of the mortar, but brick and mortar both are heated, so that the latter sets before it freezes, then stays frozen until it has thoroughly dried out, with the result of making a wall which is stronger than the average of those built in summer time.

The writer's five year old daughter went regularly to kindergarten when it was 30 below zero the same as when it was 30 above, made impressions of herself in the snow all the way home, and took off her veil because she was too warm when it was 6 below zero in the sun at midday. A temperature of 40 below zero does not cause as much of the chilly, shivery, shaky feeling in the dry atmosphere of the Northwest as a temperature of 10 above zero in the moisture laden air of the Atlantic Coast.

"It is evident that the causes which mitigate the actual severity of the climate as to feeling, which produce so large a number of clear days, and which forbid the continued presence of a large amount of moisture in the atmosphere, are those which render a climate healthful in the highest degree. Minnesota has been for many years a favorite resort for invalids. The curative properties of its climate are especially marked in the case of pulmonary complaints." And that which is true as to the healthfulness of the Minnesota climate is also true of the territory lying to the northwest, even to the Peace River country, where the cold of winter is less severe than in Manitoba.

A typical monthly report of the Health Officer of the city of Duluth is 19 deaths and 106 births.

CLOSER COMMERCIAL RELATIONS.

Similarity of environment tends to produce similarity of character. One who travels in the Northwest is at once struck with the fact that the difference between the Canadian and American populations in the Northwest is vastly less than between those populations in the East. Nothing but an imaginary boundary line separates the territory of the two nations. The conditions of life are similar and the people rapidly learning that their interests are to a great extent identical. Owing allegiance, politically, to different governments, yet they are controlled by common commercial conditions. This feeling has been given something more than abstract recognition. Conventions to promote closer trade relations have already been held at Grand Forks and St. Paul, which were attended by men of all political parties from both sides of the international boundary line. The third convention was to have assembled in Duluth last month (October), but it was deemed wise to postpone it for a time, owing to the probability of a small attendance on account of the financial depression. But it has only been postponed, not abandoned. There is a deep-seated and abiding conviction in the minds of the men of the Northwest that it would be to their mutual interest to trade more freely together. Future conventions will carry forward the work that has been already begun, and in due time the matter will be pressed upon the attention of the respective

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governments, until they take the matter up, and the wishes of the Canadian and American Northwest will be granted in so far as the rights of all the people of both nations will permit.

It is a hopeful sign that this purely business question has been taken up in a purely business way, and politics, in the sense of partisanship, has been left entirely out of the consideration.

AN OUTLET TO THE SEA.

Something in the limitless sweep of the western plains and the heavenward lift of its lofty mountains makes the men of the West undaunted by any problem, however serious, or any undertaking, however great. The farmers of the West, Canadians and Americans alike, realize that economy in transportation lies at the basis of their prosperity. They see that the average cost of transportation by rail is from 8 to 10 times the average cost of transportation on the Great Lakes, and they believe that while it is physically impossible to transport their farms a thousand miles nearer the ocean, it is entirely practicable to bring ocean transportation a thousand miles nearer their farms. Hudson's Bay, a gigantic arm of the sea, as long as from New York to Chicago and as wide as from Washington City to the Great Lakes, is thrust down into the centre of the continent, and Port Churchill, on the western shore of Hudson's Bay, is 64 miles nearer to Liverpool than is the city of New York. It is not yet settled whether navigation can be made commercially practicable through Hudson's Straits or not, but there are men in the Northwest who believe that it can be, and who propose at least to find out whether or not it can be done. It may be noted in passing that the ferry steamer "St. Ignace," plying across the Straits of Mackinac, has not been stopped since it was put in operation three years ago, winter or summer, although it has encountered solid blue ice 3 feet thick and windrows over 30 feet in height.

Meantime Canada is working steadily forward to get a navigable waterway 14 feet in depth, all the way from Lake Superior to the sea, by way of the Welland and St. Lawrence Canals. The government of the United States is at work deepening all the channels of the Lakes to the depth of 20 feet, and already demand has been made by convention after convention that this 20 feet be extended through American territory from the Great Lakes to the sea. Both channels will be constructed and made available, and if the Hudson's Bay route should not prove to be feasible, a short cut may be added by the way of Lake Nipissing and the Ottawa River, which route involves the construction of only 27 miles of actual canal, and a perfectly feasible improvement of the river channel.

REALIZATION OUTRUNS EXPECTATION.

Who dare attempt to prophesy the possibilities of the Great Northwest? All that has been said above is but a brief and imperfect outline of the facts already known, and all that is known to-day of that vast region which we call the Great Northwest is but

the preface to a volume of unnumbered pages which the future shall unfold. It has always been the case that the development of the Northwest has outrun the wildest dream of the enthusiast. When the question of making a grant of land to aid in the construction of a ship canal around the falls of the St. Mary's River was under consideration in Congress, no less a statesman than Henry Clay characterized the project as on a par with the building of a railroad to the moon. And when the legislature of Michigan was considering the size of the locks which were first built at that point, E. B. Ward, of Detroit, recognized as one of the most far-seeing men of his day, stated that the enormous dimensions of the contemplated locks were such as would not be needed during the present century, if at all. The first vessel passed through these locks in 1855, but business grew so fast that a new lock, the greatest in the world, 515 feet long, 80 feet wide and with 17 feet of water on the miter sill, was opened for business in 1881. When this lock was finished the engineers thought that now they had surely solved the question of the connection between Lake Superior and Lake Huron for all time, yet it was hardly done before it began to be outgrown and the little locks first built have been removed to make way for a lock 800 feet long, 100 feet wide and with 21 feet of water on the sill, which is to be opened for use in the spring of 1896.

Still another lock, of equal capacity, although of different dimensions, being 900 feet in length and 60 feet in width, is under construction on the Canadian side of the river, so that there will soon be in operation at the outlet of Lake Superior three gigantic locks, any one of which is larger than any other to be found elsewhere in the world.

Through the single lock now in use there passed, in 1892, 12,580 vessels, carrying 11,214,333 tons of freight. This was more than three times the number of vessels which passed through the Suez Canal in the same year, and the freight was greater by more than three million tons.

A statement has been made above of the cereal product of five of the Northwestern States as an indication of the results already attained; yet even in Iowa, the oldest settled State among those under consideration, not one-half of the area has ever been put under cultivation in any form; in Nebraska, only a little over one-quarter; in Minnesota, but one-seventh; in North Dakota, only one-eleventh. Who shall sum up the possible agricultural production of the whole Northwest when all the enormous areas above described have been brought under cultivation; when intensive cultivation has taken the place of the extensive occupation which has hitherto been the rule; and when, in addition to all else, other vast areas just as fertile, but lacking sufficient rainfall for the purposes of agriculture, have been brought into production under the magic touch of irrigation!

"Population," says De Tocqueville, "moves westward as if driven by the mighty hand of God." From the mountain valleys of Asia, where the race

was cradled, a ceaseless pilgrimage has moved ever on and on. Mountain walls and continental wilds and treacherous leagues of trackless sea may lie across the appointed path, but still the mighty column in its onward march surmounts, subdues, and crosses all, impelled by forces as resistless as those which speed the Pleiades in their course. But on the western coast of this great continent the Time-long journey shall at last be done; here in the Great Northwest the race shall reach its final home. Here have been grouped, as nowhere else in all the world, mountain and valley and plain,

river and lake and sea. Here has been stored illimitable wealth in mine and forest, sea and soil, and to these broad foundations for a sure prosperity there has been added a climate which embraces exactly those conditions which are best adapted to produce the highest possible development of the individual and the race. Here genial summer suns shall woo the fruits from fertile fields, and winter's stinging cold shall tend alike to physical and moral health. Here for a century to come shall they who hunger for a home be satisfied and all the needs of myriads of men be well supplied.

INLAND WATERWAYS FOR THE NORTHWEST.

BY EMORY R. JOHNSON.

CHEAPNESS and uniformity of rates of transportation have become a vital requisite of industrial development, and especially is this true in the United States. The ores of Michigan and Wisconsin are hundreds of miles from the coal by which they are smelted. The forests of the upper Mississippi Valley and of the vast region drained by the Columbia River and its tributaries are the chief sources of the lumber which must be distributed over the United States. The products of the farms of the North, the South and the far West must travel thousands of miles to reach the manufacturing centres of the Atlantic seaboard and the markets of Europe. When such facts as these are taken into account, it is no wonder that the United States should have the greatest domestic commerce of any nation of the world. The figures are so large that but little conception of the real magnitude of the transportation business by rail in this country is formed by the statement that the railroads of the United States are 171,363 miles long, that they carried nearly 700,000,000 tons of freight during the year ending June 30, 1891, and that the number of tons freight moved one mile—*i. e.*, the total ton mileage—was over eighty billion ton miles. The statement that so slight a reduction in tariffs on railroad rates as a mill per ton per mile means a saving of nearly one hundred million dollars a year to the general public doubtless teaches more concerning the magnitude of our traffic by rail and the importance of its being carried on at cheap rates.

The development of our inland waterways has been slower than the progress of the railroad. From the panic of 1837 until after the Civil War the improvement of inland navigation received but little attention, while the railroad, especially after 1850, spread with phenomenal rapidity into all parts of the United States. Inventive genius brought forth one improvement after another till the parlor coach of the present, the passenger locomotive capable of making a mile in thirty-two seconds, the ten-wheel freight en-

gine that can haul twelve to fifteen hundred tons of grain from Chicago to New York leave little more to be desired or to be hoped for in the railway service.

THE HISTORY OF OUR WATERWAYS.

The waterway has had a different history. Following the defeat which the small, ill-equipped canal and the unimproved natural waterways of the first third of this century naturally enough sustained in their attempt to compete with the railroads in the general carrying business and in both local and distance traffic, came a period during which the public was apathetic toward waterways. In the meantime a profound change has taken place in the industrial organization of society, a change that has revolutionized the entire transportation business. Great cities have grown up and manufactures have concentrated in them. The West has been pouring forth her vast stores of raw materials that cannot find a market without being shipped long distances. Huge trunk lines and transcontinental roads have arisen to meet the new conditions of the carrying trade. The part which the waterway, and especially the canal, must play in commerce to-day differs from its rôle of sixty years ago. This fact seems to be self-evident; but it has not been generally recognized.

A REVIVAL OF INTEREST.

A renaissance of general interest in the waterway is in progress. Its functions, as an agent of commerce, are being studied to determine to what extent its extension and larger use can reduce the costs of transportation. The International Congress on Inland Navigation, which meets biennially in different parts of Europe, is doing much to promote the technical improvement of the waterway and to throw light on the economic aspects of the question of water transportation, and numerous conventions in the interest of waterways have met in the United States during the

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