

OUR LAKE COMMERCE AND WAYS TO THE SEA.

ONE hundred and thirty-four degrees of longitude intervene between Poti at the eastern extremity of the Black Sea, and Duluth at the western end of Lake Superior. More than one-third of the circumference of the earth is compassed by a line drawn through the Atlantic Ocean between these terminals of the Mediterraneans of both hemispheres. A ship can traverse this waterway from the heart of the western to the heart of the eastern continent.

The Mediterranean Sea and the Great Lakes have been potent geographical factors of civilization. It began upon the shores of the former. The region tributary to the other is the present scene of a most vigorous exertion of its accumulated powers. It were "to consider too curiously" to speculate what the course of civilization would have been but for these beneficent physical conditions. It is certain that

"— the glory that was Greece
And the grandeur that was Rome,"

the conquests of Christianity, the deluge of the Saracen which ultimately became reflux, the immemorial impulse of migration from east to west, the civilization of northern and western Europe, and the occupation of America by the European, are among their consequences. As in the beginning of civilization so at its meridian they who came from the east to occupy the new lands, moving westward found their way prescribed and made easy by these inland seas.

More than two hundred years ago the European made his way to the western extremity of Lake Superior by the St. Lawrence River and the Great Lakes. In all his voyage the only obstacles were the Falls of Niagara and the Sault Ste. Marie. The genius of Colbert made France, of all nations except Spain, the possessor of the most widely extended colonial dominions. From the mouth of the St. Lawrence to the mouth of the Mississippi by the way of the Great Lakes she had surrounded and shut in the English colonies by that great arc of discovery and conquest. New France comprehended the valleys of the Mississippi and its tributaries from the Alleghanies to the Rocky Mountains, the Lake region in the north and northwest,

and by far the greater portion of the territory drained by the river St. Lawrence. The arctic region was contested. In 1697 Iberville fought naval battles in Hudson Bay against the English and retook Fort Nelson. In 1679 Daniel Greyselon Duluth, a French trader, transported by water his merchandise from Quebec and established a trading post near the site of the city that perpetuates his name. Ever since that time the white man has remained in that region, though for nearly one hundred and fifty years the trader and the priest were the sole forerunners of civilization. Within the last forty years this region has obtained a position of the highest economic and political importance. It is the purpose of this paper to present, in a form necessarily condensed, some significant facts which entitle this new energy of natural growth and prosperity to consideration.

The city of Duluth is about 1,400 miles by waterway from New York. Of this distance about eight hundred miles is deep water navigation on the Great Lakes. The only obstacle is along the outlet from Lake Superior, the St. Mary's River. This stream is seventy-five miles long. Between Lakes Superior and Huron its fall is twenty feet and eight inches, and of this eighteen feet and two inches are at the falls of that river called the Sault Ste. Marie, but more commonly known as the "Soo." For thirty-five miles below these falls the channel is so tortuous that its passage by night is not attempted. The difficulties below the falls will be greatly remedied by the improvement of Hay Lake Channel, which leaves the present navigable channel about two miles below the lock. This channel is a part of St. Mary's River; its lower end is nearly opposite the head of the passage between Sugar and Neebish Islands. It is about fifteen miles long, and it will shorten the distance between the lakes by about eleven miles. The improvements of the lock and the canal and of this channel, will give passage to vessels of twenty feet draught.

A few years prior to 1852 the mineral riches of the Lake Superior region came under development, and in that year the State of Michigan began the construction of the first lock at the Sault. It was finished in 1855. It was three hundred and fifty feet long between the gates, and it passed vessels of a maximum draught of eleven feet and six inches. The freight conveyed through it in 1881 was 1,700,000 tons, and it consisted chiefly of Lake Superior iron ore, which at that time supplied nearly one-third of the ore for the entire production of pig iron in the United States.

In 1864 the Northern Pacific Railroad Company was incorporated

by Congress and received a grant of lands to enable it to build its railroad from Lake Superior to the Pacific Ocean. The promoters of that road knew that it would traverse a country possessing great resources, but the most sanguine could not have hoped that the States which now span the northernmost portion of the Union with one "wide arch of the rang'd Empire" from Lake Superior to the Pacific Ocean, would ever come to be what they are. Still less was it conjectured that another transcontinental road would ever be built, as it is now being constructed, between the Northern Pacific road and the international boundary, or that such an enterprise as the Canadian Pacific railroad would ever be undertaken. But even without consideration of these affluents to the commerce of Lake Superior, the necessity of a larger lock was felt as early as 1865. It was built by the United States and was opened for navigation on September 1, 1881. It is five hundred and fifteen feet long, eighty feet wide, with seventeen feet of water over the miter-sill. Its estimated maximum capacity of passage is ninety-six vessels in every twenty-four hours for about two hundred and twenty-five days a year.

This lock had scarcely been finished when Congress required information from the War Department as to the necessity for additional works "to serve the commerce of the northern lakes." The Department recommended the construction of another lock and the improvement of Hay Lake Channel. In 1886 the sum of \$250,000 was appropriated to begin the execution of a project of general enlargement of the facilities for transit between the lakes, purposing the attainment of twenty feet in depth of navigable water. This plan includes the construction of a new lock upon the site of that built by the State of Michigan. This colossal structure is to be eight hundred feet long between the gates; one hundred feet wide, with twenty-one feet of water on the miter-sill, overcoming the eighteen feet difference in level with a single lift. The canal is to be deepened and Hay Lake Channel improved in the respects elsewhere indicated. The work went on slowly until 1890 under the limitations, uncertainties, and interruptions of appropriations that were always insufficient. At the rate of progress up to that time it was certain that many years would elapse before its completion. The existing lock was already becoming inadequate. The enormous agricultural, grazing, and mineral products of the new Northwest and the return freights of coal and merchandise were crowding it to its fullest capacity. It was correctly apprehended that a wreck in the channel or a derangement of

the mechanism of the lock such as happened on two occasions in 1890 and 1891, would arrest, as it did, the processes of a great commercial circulation. The sum of \$5,422,980 was required to complete the lock and its approaches and to improve Hay Lake Channel. In recognition of a demonstrated necessity Congress, by act of September 19, 1890, appropriated \$1,500,000, and also authorized the Secretary of War to contract for labor and material over and above this sum to complete the entire work. It is believed that this is the first instance of such a grant of authority in advance of an appropriation. This legislation secured continuity of work and shortened by several years the time of construction. It gave such assurance that immediately upon its passage many enterprises were undertaken, such as the construction of large ships, the opening of mines, and the extension of railroads which had rested solely in intention, because under former methods no one could tell when the improvements would be finished. The measure was received with the utmost gratification by the farmers of the Northwest, for they knew how much more cheaply their wheat could be carried in vessels of 4,000 tons than in those of 1,500 tons, and that this work would add to the value of each bushel of wheat at the country elevators far in the interior, and would add also to the value of every acre of their land.

Statistics are at once the bane and the necessity of such a topic as this. But they are "investigations into the political material of States." Fortunately a few large and general figures will be sufficiently demonstrative. The freight passed through the present lock in 1890 was 9,041,213 tons, an increase of 1,525,191 tons, or 20 per cent over that of 1889. To carry this 10,557 vessels were locked. The valuation of the cargoes was \$102,214,948, as against \$88,732,527 for the year 1889. A portion of this freight was wheat, 16,217,370 bushels; flour, 3,239,104 barrels; coal, 2,176,925 tons; iron ore, 4,774,768 tons.

The freight passed through the lock in 1891, though somewhat less in tonnage than that of 1890, was largely greater in value. It was \$128,178,208 as against \$102,214,948. As to wheat and flour, the increase in quantity was remarkable. It was: bushels of wheat, 38,816,570 in 1891 as against 16,217,370 in 1890; barrels of flour, 3,780,143 in 1891 as against 3,239,104 in 1890. The decrease in freight tonnage for 1891 is principally accounted for by the diminished output of iron ore caused by the depression of iron manufacturing. This decrease of ore transported was 1,214,566 tons. This depression was merely temporary, and can now safely be said to have decreased.

These figures express the commerce of Lake Superior only. That of all the lakes is of astounding magnitude. It has been said by the most competent authority that more than 22,000,000 tons of freight passed through the Detroit River alone in 1889.

New routes for traffic have frequently shifted the existing avenues of commerce thousands of miles. The discovery of the passage by the Cape of Good Hope destroyed the overland trade with the east and overthrew the commercial supremacy of the Mediterranean cities. The Suez Canal in like manner so superseded the passage by the Cape of Good Hope that the discovery of the Portuguese has become nearly as sterile as was that of the Carthaginians told of by Herodotus. It is the medium of commercial intercourse between Europe and western and southern Asia. It cost one hundred millions of dollars. It is operated day and night throughout the year. Yet its average daily tonnage for the year 1888 was less than that of the Sault Ste. Marie Canal. For the former it was 18,194 tons daily; for the latter it was 30,242 tons daily during the two hundred and twelve days in which it could be operated. In 1883, 3,440 ships traversed the Suez Canal, while during the same year 9,579 went through that at the Sault. In 1889 the freight tonnage through the Sault Canal exceeded that through the Suez by about 750,000 tons.

In 1888, 4,952,948 tons of freight were carried over the Erie Canal; that through the Sault Canal during the same year was 6,411,423 tons.

The tonnage of American and foreign vessels entered at and cleared from ports of the United States from and to foreign countries for the year ending June 30, 1890, was 30,794,653. The registered tonnage that passed through the Sault in 1890 was 8,454,435.

The vessels built on the eastern seaboard of the United States in 1890 were 756, of 169,091 tons in the aggregate. Those built on the Great Lakes in 1890 were 191, of 108,526 tons in the aggregate. The average as to each vessel of the former was about 228 tons; as to the latter it was about 568 tons.

Mr. S. A. Thompson, in a paper upon the improvement of waterways, says as to the comparative cost of transportation:

“From the careful records kept by the St. Mary’s Falls Canal, it appears that the total amount of freight passing through that canal in 1889 was 7,516,022 tons, which was carried an average distance of 790.4 miles at an average price per ton per mile of only 0.145 cent. This was only one-seventh of the average price received per ton per mile by the railways of the United States for the same year, which was, according to Poor’s Manual, 0.979 cent, or to put it in another way,

which may help you to understand its commercial importance more readily, if the freight which passed through that canal had been moved the same distance by rail it would have cost, at the average rate before mentioned, \$50,000,000 more for the transportation than it actually did cost. Wheat has been carried from Chicago to Buffalo at one cent a bushel, equal to 0.04 cent per ton per mile, and thousands of tons of coal have been laid down in Duluth from Buffalo at 25 cents per ton, or 0.025 cent per ton per mile."

Colonel O. M. Poe, one of the engineers who has watched this expansion of commerce for nearly thirty years, says that "the wildest expectations of one year seem absolutely tame the next." This is indeed true. The broadest expansion of the Lake Superior commerce has taken place within the last few years. The iron deposits of Minnesota and Wisconsin have been extensively worked only since 1885. The annual output is now millions of tons yearly, and it is greatly increasing. The agricultural and grazing products of Minnesota, the Dakotas, and Montana are increasing with astonishing rapidity and out of all proportion to the growth in population. The unprecedented crop of 1891 overtaxes the power of the railroads to move the portion that has been threshed, and much of it remains unthreshed for want of men and machinery to do the work. The ore and the herds of Montana are as yet in their beginnings of production. The natural outlet of all these is by way of Lake Superior and the locks at the St. Mary's River. The Great Northern Railroad, already constructed from the head of Lake Superior into Washington, and, figuratively, within sight of the Pacific Ocean, has opened to settlement that immense and fertile region that lies next to the international boundary. Not a tithe of a tenth of the productiveness of this new Northwest of our country has yet been displayed.

But this is not all. The Canadian Pacific Railroad extends from Montreal to Vancouver. Its construction was aided by lavish grants and subsidies, and it is liberally sustained by the Government. A vast and productive territory west of Winnipeg is tributary to it. Another region, as yet almost a solitude, lying north of its line, is expectant of civilization. It is known as the Peace River valley, and, owing to the depression of the Rocky Mountains along its western border, it has quite the same climate as that part of the Dominion of Canada that lies next the international boundary, and it is equally productive. Altogether, the region north of the international boundary up to the fifty-sixth parallel of north longitude and east of the Rocky Mountains to and including the province of Manitoba, is

estimated to contain about one hundred millions of acres well adapted to grazing and cereals. The valley of Saskatchewan is comprehended in this domain. From its source in the Rocky Mountains to its mouth in Lake Winnipeg it drains a basin more than 1,000 miles long and is navigable for 850 miles. Up to the year 1883, 61,961,772 acres of this region had been surveyed and 9,337,719 acres had been sold for cultivation and grazing. In 1890 the population of Manitoba and the northwest Territories was 221,996, and the surplus of wheat for export is estimated at 25,000,000 bushels.

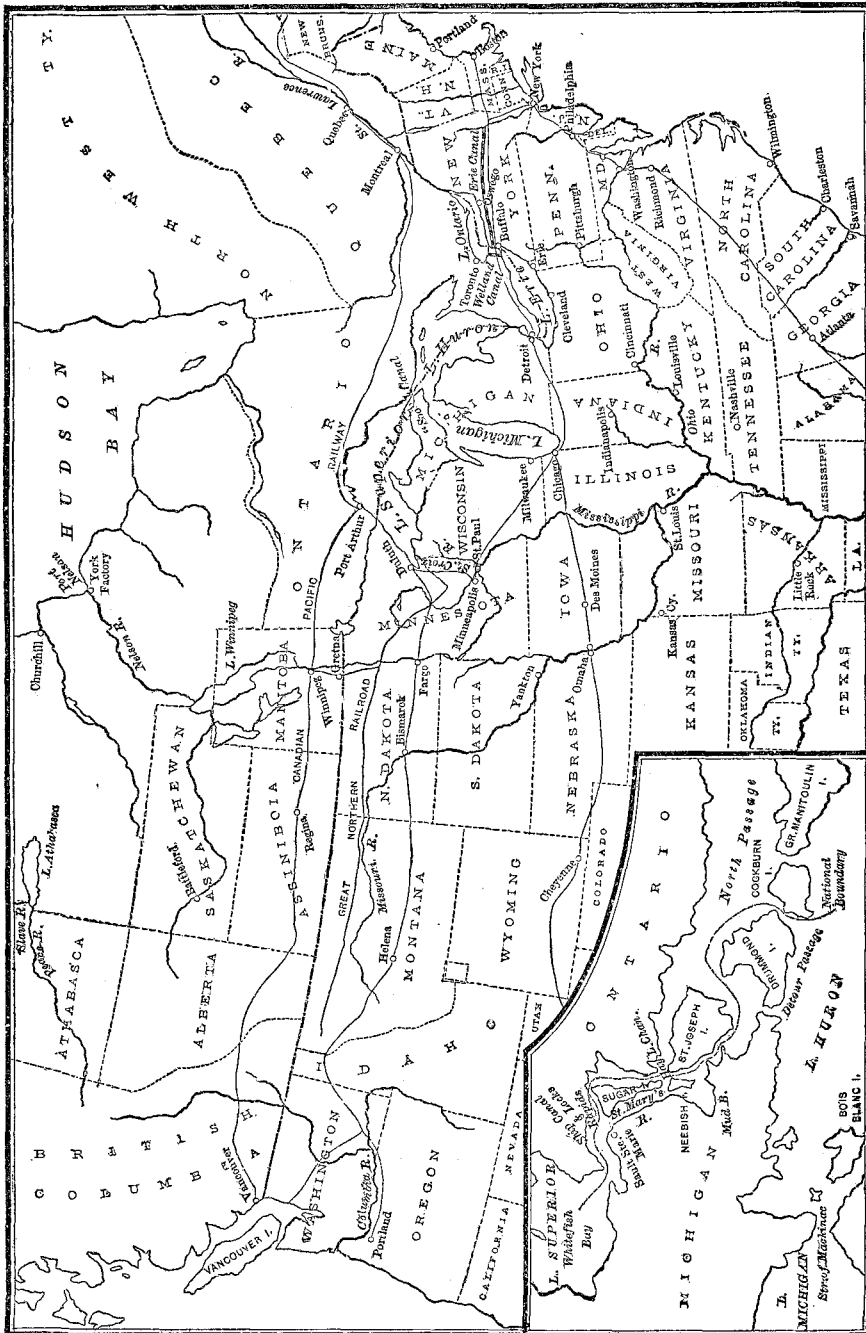
This territory to the north of the Canadian Pacific Railroad will within a few years have its system of railroads, main lines and laterals. Freight in transportation is not restrained in its course by international boundaries. The railroad will find the nearest ship. Restrictive policies of rival governments cannot prevent the attainment of this object. Capital is cosmopolitan, and its employment in enormous masses in subjecting new regions to civilization, with the rapidity of military invasion, puts aside the policies of the states, and substitutes others for them. Capital, domestic or foreign, is the mercenary of modern development, useful when subordinated to the extension and consolidation of dominions, but destructive when it revolts, capital captured the site of the Suez Canal. It invaded the Isthmus of Panama. It is dominant to-day in Nicaragua.

A destiny that is manifest has dedicated these northern regions to social and economic affiliations and to ultimate and peaceful political coalescence with the United States. The Canadian government is building a capacious canal and lock on its own side of the St. Mary's River. Meanwhile its vessels are using our own structure free of charge. If a prediction were now made with anything like accuracy as to what the next twenty years will bring to pass in the waterways between the head of Lake Superior and the Atlantic Ocean and in the vast region alluded to, it would be scouted as a rhapsody. A future that is very near and clearly visible is making demands which will overtax national and individual resources. Other considerations, remote but by no means rashly speculative, demonstrate the necessity for the improvement of our internal waterways to their utmost capacity and to ultimate connections with the sea by ship navigation. It is of the highest and most permanent importance that the traffic, domestic and foreign, of the territory now tributary to this system of waterways, or destined to be so if our natural advantages are made the most of, be held to the present tendency to become so. It has

been seen that the products of an immense region in our country and of one of vast extent in the Dominion of Canada, are, by railroads and navigable waters running from west to east, borne as by a current to the great northern lake. By methods of transportation, even now inadequate and so expensive as to impose the greatest tax that the producers pay, the greater portion of these products reaches the Atlantic ports of the United States. This advantage may not always remain entirely with us. One shorter and more northern route to Europe has already been opened by the vigor and daring of our Canadian neighbors; the foreign commerce of Montreal is growing and is subtracting from that of our own ports.

There is still another and a shorter haul along the line of a more northern latitude. The distance from the northern line of Minnesota to Churchill, on the west coast of Hudson Bay, is about eight hundred miles. Lake Winnipeg, having a navigable area nearly equal to that of Lake Erie, occupies about one-third of this distance and a navigable reach of the Saskatchewan of nearly eight hundred miles extends west from Lake Winnipeg. The harbor of Churchill is excellent. It is no further away from Liverpool by ship than New York is. It is as near to Liverpool as Montreal is. The city of Winnipeg is sixty-nine miles from Gretna on the International line. Winnipeg is 1,424 miles from Montreal by the Canadian Pacific Railroad; it is about 1,800 miles distant from New York City by rail through the United States. A glance at the map, or measurement by dividers on a globe, will demonstrate by an application of these figures the great saving in railway haul and of other expenses in reaching tide water that will be insured by the producers of a vast region in the new Northwest whenever this new route to the ocean shall be opened.

The situation has not escaped the attention of the Canadian government. And it must be conceded that from the time when it began the construction of the Welland Canal that government has understood and utilized its advantages of land and water transportation with the utmost intrepidity and sagacity. It has adopted measures having in view the construction of a railroad from Winnipeg to Churchill. In 1878 it sent the ship Neptune from Halifax with a company of scientific and practical observers to investigate the navigability, the depth, and the utility of Churchill and the other harbors on Hudson Bay. It was found that the harbor of Churchill could be easily utilized for all purposes. Ice forms there about the middle of November and disappears about the middle of June, giving about one



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hundred and fifty days in each year for navigation by ocean ships. The average time during which the port of Montreal has been open is from May 2 to November 23. The canal at the Sault Ste. Marie for the five years ending with the year 1888 was open for an average period of two hundred and twenty days in each year. Commodore Markham said in a paper read before the Royal Geographical Society that the temperature of the waters in Hudson Bay is ten degrees higher than that of Lake Superior. Hudson Bay was a commercial waterway more than two hundred years ago. The naval battles fought upon its waters in 1697 between the French and English were for commercial supremacy over the Bay and the territory to the south and west. The Hudson Bay Company was incorporated in 1760, and from the time when it commenced its operations in those portions of North America until the year 1864, it sent out its men and supplies from London, and carried back its furs by ships into Hudson Bay. Moose Factory, on the southern coast, was visited annually by a ship from the year 1736, with the exception of the year 1779. These voyages were made by sailing vessels of small tonnage, unaided by charts, lights, or improved harbors. The iron steamships of the present day, with their enormous tonnage, could move the products of the region tributary to this route, just as the freight of the north-west is now transported by way of Lake Superior.

This route will in time be opened. So long as it is merely in contemplation it will be declared impracticable by interested opponents and parochial geographers, just as the Northern Pacific and the Canadian Pacific railroads were in their time. The disposition of the public lands in the Dominion will soon begin to have its effect. Nearly all the arable and grazing lands in the United States have passed into private ownership. The agitation of the land question, theoretical and practical, which has for some years so profoundly stirred the minds of all classes, is expressive of that desire for the possession of land which is a human instinct. When nations feel it, conquests follow. When individuals act upon it, that action is migration. The time is not remote when a great manifestation of this individual impulse will take place in this region. The importance of adjusting, by most ample enlargements, all our functions of internal communication by water, as they at present are, and of at least extending them by deep-water channels to the ocean, is magnified by the possibility of competition for a great traffic. The Lake Superior route should, in this aspect, be most liberally developed. Some ex-

amination is necessary to give a full understanding of its importance. One illustration will suggest inquiry. Draw a line from the "Soo" passing through Des Moines. All points north of that line are nearer to Duluth than they are to Chicago.

An immense freightage of four of the great lakes in its course to tide water must be transferred at Buffalo, to proceed thence by railway or by the Erie Canal. Breaking cargo and reshipping create an expense of an enormous aggregate. But even as to the New York system of canals the route can be greatly improved and made less expensive. A ship canal around the falls of Niagara capable of the passage of vessels of twenty feet draught has become a necessity. A canal around the cataract was recommended by Albert Gallatin when he was Secretary of the Treasury and by James Madison in 1816, under the "bloody instructions" of the war of 1812. In 1835 a survey for such a canal of a depth of ten feet was made by the United States. Since then other surveys have been made, and its construction has been repeatedly recommended by reports of committees of Congress. The development of the West and Northwest, the improvement at the Sault Ste. Marie, and the anticipated completion of the canal from Chicago to the Mississippi River and of another from the head of Lake Superior to the St. Croix River, enforce immediate and favorable consideration of this project. Cargoes transferred to canal boats at Oswego are one hundred and forty-five miles nearer New York than if transferred at Buffalo. To the Hudson River by this route the average trip is four days, as against an average trip of six days from Buffalo. The Niagara Canal can be passed in eleven hours, and the passage thence to Oswego can be made in eight hours. This is a saving of twenty per cent of the average time of the trip from Buffalo.

The extension of this system of deep-water lake navigation to tide water is receiving careful consideration. It is believed to be entirely practicable. Other nations are constructing works of this character. The Manchester ship canal will be thirty-five miles long, one hundred and twenty feet wide at the bottom, and twenty-six feet deep. It will cost \$27,000,000. The canal between the Baltic and the North seas across Holstein is under construction by the German Government. It will be sixty miles long, eighty-five feet wide at the bottom, and twenty-eight feet deep. Its greatest depth of cut is one hundred feet. It will cost \$40,000,000. The whole subject is so important that the most that can be done here is compendious suggestion.

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A GREAT DOMAIN BY IRRIGATION.

"IRRIGATION makes homes for millions better than the rain makes homes." The prosperity of the people living in the so-called arid regions averages better and higher than the prosperity of those living in any of the sections under the rain-belt of the United States. In irrigated countries, the condition arising from crop failures owing to too great a rain-fall on the one hand, or to drought on the other, is entirely eliminated and is not a factor in results. A man's living is sure. Nothing needs to be subtracted from the sum total of the product on account of crop failure. In the arid regions of the United States, taken as a whole, conditions prevail which are much more advantageous to the tillers of the soil—whether cultivating grain or fruit—than the conditions in those sections of the country dependent for a crop outcome on the rain-fall. These, briefly stated, are: a richer and more prolific soil, gentler climate, greater variety of products, cheaper land, larger yield per acre, less labor in making homes, less capital required to own a farm, cheaper living, the prospect of great advance in the price of land on account of settlement and improvement and because in great part the arid lands are fitted to produce crops common to both the temperate and semi-tropic zones.

The arid region of the United States, as stated by Major Powell, covers an area of 1,500 miles in its widest part, from east to west, and 1,000 miles from north to south. It embraces the area between the 100th meridian and the Coast Range, and from the British Possessions on the north to Mexico on the south. This space contains over a million of square miles—one-third of the area of the United States, excluding Alaska—equal to more than 600,000,000 acres. All of Arizona, New Mexico, Utah, Wyoming, Idaho, Colorado, and Nevada and portions of California, Oregon, Washington, Texas, Kansas, Nebraska, North and South Dakota, and Montana lie within this belt.

For data in this article I am under obligations to the writings of the late Patrick Hamilton, Esq., Major Powell's "Lands of the Arid Regions," the "Report of the Special Committee of the United States Senate on the Irrigation and Reclamation of Arid Lands," made to the Fifty-first Congress, and to "The Irrigation Age."