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Lake Erie and Its Southern Ports

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used first by the white man and until the time of the steamboat were keel boats, barges and flat boats. The steamboat era followed and from that day the river has brought continually to the doors of Cincinnati coal from the east, lumber, salt, clay and other products from the mountains of West Virginia and Kentucky.

Through the river, canal, turnpikes and finally the great systems of railroads, centering here and diverging in all directions, were established the conditions under which Cincinnati has grown into a great commercial city.

After the civil war came a period of rapid growth of railroads and Cincinnati being a terminal for many railroad lines quickly recognized its opportunities and by industrial development sought to meet them. The principal items of commerce nearly all show steady and substantial evolution and growth. The abundant and cheap coal supply with the necessary raw materials near at hand made this city develop rapidly as a manufacturing center. Its location was especially suitable for marketing of lumber, tobacco, cotton, wool, livestock and hides.

As a city Cincinnati has been the focus of various streams of life which have here met and mingled. The climate is not attended by extremes of temperature and the healthfulness ranks high. The city has passed from commercial preeminence to industrial preeminence. This industrial development has not been one-sided. "The lines of industry include the manufacture of clothing, shoes, soap, leather, harness and saddlery, vehicles, furniture, machinery for woodwork, machine tools, office and bank equipment, veneering, school books, lithographic and other high class printing, printing inks, whisky, beer, pork and beef products, pianos, and other musical instruments, decorative pottery, etc."

LAKE ERIE AND ITS SOUTHERN PORTS

By W. E. DURSTINE

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ONE of the important results of the last invasion of the great ice sheet was the formation of Lake Erie. The influences of this lake are many and far-reaching. Among the things affected are the following: location of industrial cities from other natural resources, climate of the surrounding region, freight routes and rates, food supplies, water supply for the cities, and the cost of power for manufacturing and transportation.

During the open season a boat passes out of or into Lake Erie every twelve minutes and the Lake Erie ports receive 85 per cent and ship 24

per cent of all freight that passes over the Lakes. The harbors of this lake are the mouths of small streams and consequently in the busy season shipping is congested.

Along the southern shore of Lake Erie have grown several cities that owe their importance to their location on the lake. "Gold is precious but iron is priceless," and at these cities the ore from the upper lake regions meets the coal of Pennsylvania, Ohio and West Virginia. These ports receive 83 per cent of all the ore shipped over the lakes and the chief receiving cities are: Ashtabula 20 per cent, Conneaut 17 per cent, Cleveland 15 per cent, Buffalo 12 per cent. Trains bring coal to these cities and return loaded with ore. With the discovery of iron ore in the northern lake regions has come the shifting of the centers of iron manufacturing from southern to northern Ohio.

Many of the ore boats return with cargoes of soft coal. Of this, Lake Erie ports shipped 94 per cent in 1909, distributed as follows: Toledo 23 per cent, Ashtabula 20 per cent, Cleveland 18 per cent, Lorain 12 per cent. Lake Erie ports shipped nearly 6 per cent of all the hard coal mined in the United States, 85 per cent of this leaving the port of Buffalo. Iron manufactures make up another return cargo, Cleveland shipping 45 per cent and Buffalo 30 per cent of all such shipments over the lakes.

The change of the wheat producing region from the west to the northwest has made Duluth, Superior and West Superior the chief ports for the shipment of wheat. However, the amount of wheat shipped over the lakes is decreasing for more is consumed at home and much of the wheat producing area is in Canada. This wheat would find a ready market in the United States but the high tariff prevents it entering the country except in such amounts as the millers need to mix with the home grown wheat to make the best grades of flour.

Lake Erie ports receive almost all of the grain shipments; Buffalo being the chief port, receiving of the wheat 87 per cent, corn 70 per cent, oats 64 per cent, rye 50 per cent, flaxseed 83 per cent, flour 60 per cent, barley 67 per cent.

Buffalo is destined to become one of the largest inland cities in the United States because of its location at the eastern end of 1000 miles of inland water-way system and at the western end of the Mohawk depression. When the improvements of the Erie Canal are completed its importance will be much increased. Now the canal will admit boats of 240 tons, then 1000 ton boats can be accommodated, thus reducing the freight rate to probably one-fourth of the present charge. Even now it leads the cities of the lakes in receipt of inbound freight.

Buffalo will be vastly influenced in its development by the "white coal" of Niagara Falls. This inexhaustible supply of power is equal to one-fourth of that now developed from soft coal in the United States.

This allows a very great expansion of manufacturing in the Buffalo region. Many of the industries that are grouped around Pittsburg and other cities on account of cheap coal can find still cheaper power near Buffalo. Here power can be furnished for one-fifth what it costs in New York City, one-fourth in Cleveland and one-half in Pittsburg. It has been estimated that power can be produced for \$10 per horse power per year and still pay all expenses and 4 per cent on the investment. Niagara is capable of saving, on account of the greater efficiency of electricity in factories, etc., enough soft coal to fill annually 50,000 trains of 50 ton cars, 40 cars to the train. In other words, a saving of more than one-fifth of all the soft coal mined in the United States in 1907 can be made. Within a radius of 500 miles of Buffalo live 60 per cent of the entire population of North America. Therefore, the geographical advantages of Buffalo are: its vast market near at hand, 1000 miles of inland sea route, the Erie canal and the St. Lawrence river connecting it with the tide water and the perpetual cheap power of Niagara Falls.

The early settlement in the vicinity of Cleveland was made at Newburg Heights because of the malarial condition at the mouth of the Cuyahoga river. When the Ohio and Erie canal, connecting Cleveland with the interior of the state, was opened in 1835 the city began its real growth. The country along this canal had been practically isolated and farm produce was almost worthless because of the lack of transportation facilities to market. Corn sold for ten cents and wheat for twenty-five cents per bushel. But the canal changed all this. Cleveland was favorably located to receive the benefits of this trade. Along with the farm produce came pig iron made from the bog ore of Summit County, wool, clothing, timber and coal. So the city became not only a distributing point but also a manufacturing center. Along the course of the river for several miles from the lake the flats are suitable for docks, yards, warehouses and factories. The crookedness of the river increased the river frontage and so was of great advantage in the early days. But with the advent of the 600 foot freighter, this condition became a hindrance and many shippers are now seeking more favorable ports, which are not so congested. Cleveland was the principal ore receiving city on the lake because boats could unload at the furnaces. The valley has become filled with steel mills and allied industries. This same valley forms an easy grade for the transportation of coal from the coal districts for the factories and also for trans-shipment over the lakes.

The harbor of Cleveland finally became so congested that some method of relief was sought. Ashtabula and Conneaut afforded ample harbors with cheap land adjoining. Railroads were easily built from these places to the coal fields. The owners of the ore, ore boats, railroads and coal fields were very closely affiliated and were very quick to see the advantages afforded by these two ports for the trans-shipment of coal and ore.

So docks were built equipped with the latest machinery, and ore can be handled for ten cents per ton. These two cities are not as large as might be indicated by the amounts of receipts and shipments for most of the work is done by machinery and very little by hand labor.

The original settlement near the site of Toledo was at Old Fort Meggs, about ten miles up the Maumee river, but with the development of the country, boats were in demand to sail the Great Lakes. Around the mouth of the river were abundant forests and soon ship-building became a thriving industry. Then Toledo began to grow. With the depletion of the forest and the advent of the steel freighter the building of wooden ships became less important. Wooden manufactures as wagons, cars and agricultural implements are important products here.

The railroads connect this city with the extensive coal fields of West Virginia and as this port is a convenient place to exchange cargoes of ore and coal, Toledo has become the chief port on the lakes for the shipment of coal. The railroads have provided ample yards and coal handling facilities. As might be expected, large steel mills have seen the advantages afforded and have located here. Other industries, which depend upon steel are also numerous. One of the largest and best equipped ship-building yards has been constructed here as cheap steel is easily obtained and the water front affords ample room for the construction and launching of ships.

THE ISLANDS OF LAKE ERIE

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THE islands of Lake Erie are situated in the western end of the lake and consist of the five larger islands, viz: Pelee (11,000 acres), Kelley's (3,000), South Bass or Put-in-Bay (1,500), Middle Bass and North Bass. Among the dozen or more smaller islands may be mentioned West Sister, Middle Sister, East Sister, Green, Rattlesnake, Sugar, Middle, and the Old Hen and Chicken group.

The shallower water of the western end of the Lake, as well as the presence of the islands here located, is accounted for by the axis of the Cincinnati anticline passing through this western end of the Lake. All of the islands belong to the eastern half of this truncated fold. The western islands of this group (with the possible exception of East Sister Island) are included in the "Waterlime, or Lower Helderberg" of the Upper Silurian, while the eastern or Pelee-Kelley's Island chain belongs to the "Corniferous" limestone of the Devonian.