"Chicago: The Hydraulic City and its Environmental Impact." A paper delivered at the 15th Annual Illinois History Symposium of the Illinois State Historical Society, December 2, 1994.

Chicago: The Hydraulic City and Its Environmental Impact

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First of all, what is a hydraulic city? It is one that is created with a close connection to waterways. It is created in the sense that its water connections are not natural but have to be made. It is a city that uses water for transportation on inland rivers and canals as well as on larger bodies of water, in this case, the Great Lakes. It draws its water for drinking and sewerage from the same sources that it uses for transportation. It also designs its waterways for hydraulic power. Also, the hydraulic city is very conscious of military defenses, which by extension it sees as related to its water transportation, so it has a hydraulic concept of military defense.

As to the environment, I do not mean environmental depredations, but rather the need for extensive changes via engineering to create harbors, inland transportation routes, sanitation and drinking needs, as well

> 90 miles to the great village of the Illinois [near Utica]. Canoes cannot traverse it in the summer."[2]

La Salle was accurate in his observations that the only natural advantage to the Chicago site was the small continental divide that separated the Des Plaines from the Chicago River, a separation that was breached every spring when the Des Plaines flooded into Chicago, sending a large quantity of water into Lake Michigan rather than into the Illinois River.

improvements was scanty, the Federal government continued to aid in the improvement of the Chicago

Various efforts were made to raise the capital necessary for this undertaking. The only assistance coming from the Federal government was land grants on either side of the proposed canal. In 1830 the second Illinois and Michigan Canal Commission laid out the towns of Chicago and Ottawa, the latter located at the junction of the Fox and Illinois rivers. They did this in an effort to sell town lots in the newly created towns to finance preliminary work for the canal. Although hardly anything was raised, interest in the canal and the harbor intensified. It will be remembered that it was in that year a plan for changing the mouth of the Chicago River and protecting it with a line of piers thrust out into the lake was first proposed. The development of the canal and the harbor continued apace, one financed by the State and the other by the Federal government. The State had much less access to capital, and sought to raise the necessary funds by selling the lands given by the State by the Federal government. In 1836 the Canal Commissioners held a successful auction of lots mostly in Chicago, and a few were in Ottawa. The total realized in Chicago was $1,522,545.[13] Although this was considerably greater than the $4,362 realized in the 1830 sale, the money was not immediately forthcoming. In 1839 a depression hit and in 1840, 76 of the purchasers, including W.B. Ogden, were asking for a considerable reduction in the 1836 price.[14]

The construction of the canal began on July 4, 1836, when with much ceremony, crowds went up the Chicago River's South Branch to hail W.B. Archer as he turned over the first spade of earth. The canal would go from Bridgeport (then outside Chicago) to La Salle, where it would join the Illinois River some 96 miles south and west of Chicago. The construction was impeded by the state's lack of capital, but it was finished finally in 1848. During the first five years of its existence, the canal's principal business was the passenger traffic. These were mainly settlers who arrived at Chicago and wanted to move west. In 1853 the Rock Island - Chicago Railroad was completed, running beside the canal to LaSalle. The railroad bought out the passenger boats.

After 1853 the major business was freight, particularly grain products, lumber, stone and coal. Until well after the Civil War, the canal brought in more corn to Chicago than any other single rail line. The Rock Island, which ran alongside the canal from Joliet to La Salle, and had access to Iowa as well as Western Illinois, never equaled the canal in bushels of corn carried despite the fact that the canal was only open from April to November.[15]

The opening of the canal in 1848 soon brought a change in the status of Chicago and its older mid-western rival, St. Louis. The water connections of Chicago not only with the East via the Great Lakes, but also with the Gulfaterpening ,o .Aa firbnni3486as imped 21.486Bt the sta5(had6(capiTheoca)TThe0.0The061 Tw0 Tc 0 Tw

> canal been completed, there would have been, during the season past, an unusual supply of water, as the surface of the lake has been nine feet four inches above canal bottom, or three feet four inches higher than was originally calculated upon for the supply."[17]

The canal was not able to directly tap into Lake Michigan when it opened in 1848, because the State was so short of capital it was unable to afford the "deep cut" to give the canal direct access to Lake Michigan waters. Water power at Lockport was supplied by pumping water out of the Chicago River at Bridgeport and from a feeder canal supplied by the Little Calumet River. However, in 1870 with the help of the City of Chicago, the "deep cut" was made. The Summit Lock No. 1 at Bridgeport was removed, and the flow of the Chicago River was reversed, so it flowed south and west

In addition to the hydro-electric plant, the Sanitary

> St. Lawrence into the Lakes with facility. We cannot do it at all. Great Britain has constructed canals for this express purpose. We have no such military canals."[30]

The concern about Great Britain and a possible naval attack did not lessen after the end of the Civil War. In 1867 the United States Congress commissioned a report on enlarging the I. and M. Canal, amongst other studies aimed at making the waterways above St. Louis larger so river boats could travel to the Great Lakes. The officer-in-charge of these surveys was Brevet Major General J. H. Wilson. In his report on the survey, he lays a heavy emphasis on the defense needs. His report to the Secretary of War and Congress is to our eyes startling, but it expounds on what could be called a hydraulic concept of defense.

> "A thorough discussion of these improvements [of the Illinois River] in their military, commercial, and political aspects, if necessary, would be out of place at this time, but I cannot forgo a passing allusion to them. The recent confederation of the British American provinces shows the anxiety felt by the English government in this behalf, and must be regarded as a movement in hostility to the people and institutions of the United States.
>
> "While it does not actually increase the aggregate British strength on our Northern Frontier, nor in any way encroach upon our territorial rights, it consolidates the policy in regard of canals, as well as other matters, and renders available the entire force of those provinces in any difficulty that

15. *Second Annual Statement of Trade and Commerce of Chicago for 1859,* Chicago Board of Trade, Seth Catlin, Sec't., Chicago, Ill. 1860, p. 34.

    Fifth Annual Statement of Chicago Board of Trade, Seth Catlin, Sec't., Chicago, Ill. 1863, p. 16.

    Sixteenth Annual Report Chicago Board of Trade, Charles Randolf, Sec't., Chicago, Ill. 1874. In this year the canal was the fourth largest shipper, but on some months in the summer it was the largest shipper.

    See also. Putnam, James, *The Illinois and Michigan Canal: A Study in Economic History,* University of Chicago Press, 1918, pp. 112-113.

16. Wyatt, Winton B., *The Economic Rivalry Between St. Louis and Chicago 1850-1880,* Columbia University Press, New York, 1947, p. 34.

17. Gooding, William, *Report of the Engineer, Fourth Annual Report of the Canal Commissioners of the Illinois and Michigan Canal,* December 1839, Springfield, Ill., pp. 19-20.

18. Lamb, John, *A Corridor in Time,* Lewis University, Romeoville, Ill., 1987, p. 13

19. Jenne, D.C., Chief Engineer, *Report of Waterpower Appendix A, Report of the Canal Commissioners,* Dec. 1, 1872, Springfield, Illinois, 1873, p. 42.

20. op. cit., Lamb, John, *A Corridor in Time,* p. 23.

21. *Governor's Message to the Forty-Seventh General Assembly-Special Session,* Appendix, Springfield, Illinois, 1911, p. 12.

22. Brown, G. P., *Drainage Channel and Waterway: A History of the Effort to Secure and Effective and Harmless Method for the Disposal of the Sewage of the City of Chicago,* R. R. Donnelley & Sons Co., Chicago, Ill. 1894, pp. 28-29.

23. Cain, Louis P., *Sanitation Strategy for A Lakefront Metropolis, The Case of Chicago,* Northern Illinois University Press, De Kalb, Illinois, 1978, p. 27.

24. Ibid., pp. 46-51.

25. Barrett, George F., *The Waterway from The Great Lakes to The Gulf of Mexico,* Facts and Records of a Century, Sanitary District of Chicago, 1926, p. 57.

26. *Plan for Waterpower Extension of The Chicago Drainage Canal,* Engineering News, Jan. 12, 1905, Chicago, Ill., p. 26.

27. op. cit., Barrett, *The Waterway,* etc.

28. op. cit., *Governor's Message to 47th General Assembly,* etc., p. 14.

29. op. cit., Cram, T. J., *Report on Harbor Improvements on Lake Michigan,* etc., p. 19.

30. *Memorial to the President and Congress of the United States, Proceedings of the National Ship Canal Convention Held at the City of Chicago,* June 2-3, 1863, Chicago Tribune Co., 1863, pp. 232-233.

31. Wilson, C. H. Lieut. Col., *Report – Survey of the Illinois River*, Letter from the Sec't of War 40th Congress, 1st Session, House of Rep. Ex. Doc. No. 16, Washington, May 14, 1867, p. 9.

32. Mss. Stone, George F., Letter from Stone, Sec't of the Board of Trade of the City of Chicago – *"Letters of Survey 1900-1902,"* National Archives Great Lakes Section, Chicago, Ill.

33. Guillerme, Andre E., *The Age of Water: The Urban Environment in the North of France*, A.D. 300-1800, Texas A. & M. University Press, College Station, Texas, 1988, p. 7.