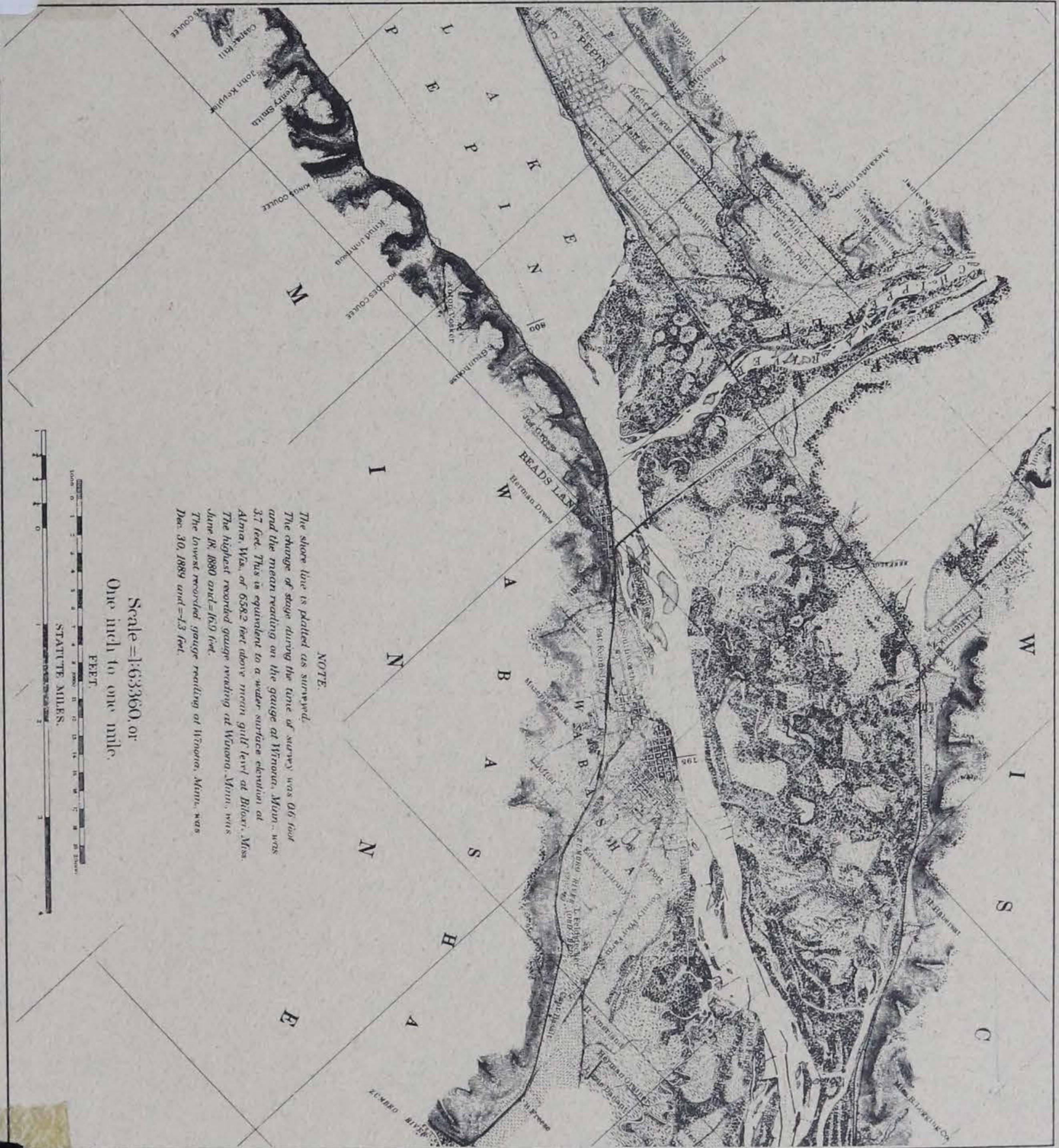


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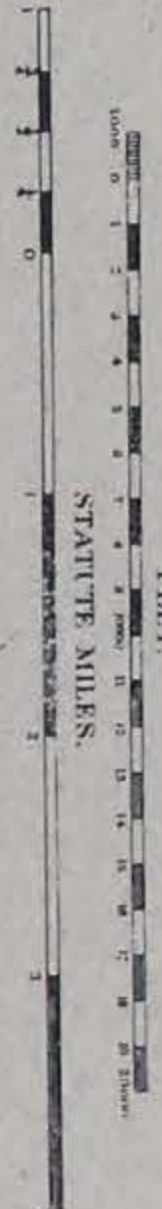
# A RIVER OF GRAIN

## The Evolution of Commercial Navigation on the Upper Mississippi River



**NOTE.**  
The shore line is plotted as surveyed.  
The change of stage during the time of survey was 0.6 foot  
and the mean reading on the gauge at Winona, Minn., was  
3.7 feet. This is equivalent to a water surface elevation at  
Alma, Wis., of 658.2 feet above mean gulf level at Biloxi, Miss.  
The highest recorded gauge reading at Winona, Minn., was  
June 18, 1890 and = 16.9 feet.  
The lowest recorded gauge reading at Winona, Minn., was  
Dec. 30, 1889 and = -1.3 feet.

Scale = 1:63360, or  
One inch to one mile.



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# **A RIVER OF GRAIN**

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## ***THE EVOLUTION OF COMMERCIAL NAVIGATION ON THE UPPER MISSISSIPPI RIVER***

*by* **RICHARD HOOPS**

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# ACKNOWLEDGMENTS

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the character of government policy regarding the Upper Mississippi River.

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# INTRODUCTION

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**M**ystery is defined as something beyond understanding or as a truth that can be known only through revelation, and it is a quality that pervades the natural world that surrounds us. The essence of this world, whether it is the complete power of the sea or the silent elegance of a hawk's flight, are beyond description or measurement, and their secrets are ones divulged through revelation, not numbers or graphs. The character of the world's great rivers is heavy with this mystery, for neither their origins nor their destinations can be known from vantage points along their banks. Only the stretch that lies before one's eyes can be grasped directly; the rest of their flow passes through provinces of either memory or conjecture.

One of the world's great and mysterious rivers is the long track of water incised into the middle of the North American continent. The Mississippi River has awed writers for three hundred years and it has fascinated and supported humanity for centuries more. This great river sustained the prehistoric metropolis of Cahokia, fed the imagination of Mark Twain, and floated the steamboats that brought European immigrants to the Falls of St. Anthony and the fields of Minnesota. The Mississippi River is known around the world, but many who live close by may see it as only an exclamation point in the landscape, one they may glimpse from a bridge and then quickly forget. The Mississippi River is much

more than an element of geological punctuation, though; it is a great and mysterious story unto itself, a story that may go unappreciated until some revelation, such as the arc of a hawk's flight across the spring sky, opens one's senses to the richness of life that pulses through this river and its valley.

Perhaps the most spectacular stretch of the river lies south of its confluence with the Minnesota and St. Croix rivers and north of its confluence with the Missouri River. There, the river flows beneath bluffs that were carved hundreds of thousands, perhaps millions, of years ago. Cliffs rise three or four hundred feet above the river's floodplain, and the chasm's floor lies buried beneath more than one hundred feet of sediment. In its natural state, the water of the Upper Mississippi River flowed in skeins around islands and through backwater sloughs, creating abundant habitat for all manner of fish and wildlife.

Humans have been part of Mississippi River ecology for as much as ten thousand years. Until the nineteenth century, their mark was little more than discarded pottery, tools and shells. With the arrival of soldiers and settlers from the eastern United States and immigrants from Europe, the mark of humanity became that of an industrial society, a society that seldom leaves a benign imprint on the natural landscape.

Considering the natural abundance of the river, the idea that it could be improved by artificial means seems quite odd.



The Upper Mississippi River flows for more than six hundred miles from the Falls of St. Anthony in downtown Minneapolis to the mouth of the Missouri River near St. Louis.

However, the humanity that streamed toward the river from the east brought that concept to the river during the nineteenth century. These people pursued "improvements" that were directed toward one end—navigation—and involved the maintenance of a stable channel for steamboat traffic. Their physical modifications typically involved wing dams that extended from the banks of the river and funneled water toward its center to scour the riverbed deeper. The success of this enterprise for steamboat commerce was irregular. However, it was consistent in disrupting the natural flow of water to backwater reaches, and this interference allowed sediment to settle out of stagnant water and transform fertile wetlands into dry land. Along with this disturbance, industrial activity often contaminated river water with sewage from river towns and with refuse from sawmills and packing plants.

More recent human modification of the Upper Mississippi River has involved the construction of 29 dams between St. Louis and Minneapolis, a project that transformed the upper river into an "aquatic staircase" for commercial barge fleets. During the 1920s and 1930s, industrial agents from Minneapolis and St. Paul lobbied for the project in the hope that restoration of commerce to the upper river would provide relief from high railroad rates. The government system of locks and dams was finished by 1940, and this subsidy to river commerce prompted a slow but steady rise in river traffic during the next twenty years. Commerce on the upper river boomed during the 1960s and 1970s as world markets for corn, soybeans and wheat exploded and grain merchants and shippers hauled millions of tons of the commodities from elevators in the upper Midwest to ports on the Gulf of Mexico.

The locks and dams were built to establish a navigation channel nine feet deep, and the imposition of this project on

the Upper Mississippi River flooded stretches of its wetlands and floodplains. It also slowed the river and profoundly changed its nature. Populations of some fish that thrived in the river when it was unrestrained diminished with the slowing of the current. The change in the river's flow, when combined with erosion from nearby agricultural land, also increased problems with sediment in the river's wetlands. The growth in commercial navigation contributed to this problem, for towboats and barges riled the river's bottom, and sediment that is stirred into the water can drift into backwaters and settle there.

Sediment accumulations that are measured in inches per year may not inflame public opinion, but they deserve the public's attention. Environmental scientists have written that the problem, if unchecked, may erase the river's tremendous biological diversity within a century and turn it into little more than a barge canal. Cures to this slow compromise of the river's health will not be simple, for they must deal with agricultural practices, commercial navigation and the demands that people make on the river for recreation. The environmental awareness that has bloomed since World War II, and its incorporation into law and government bureaucracies, promise that people and institutions will work toward such cures. Preservation of the river's health may demand more than mitigating the effects of human activities, though; it may demand curtailing those activities to allow the river's lost abundance to return. The importance of the Upper Mississippi River as a natural habitat has never diminished, but its value as a navigation route has vacillated with changes in commercial circumstances. Whatever prescription people and their institutions make for the river's future should consider the circumstances that imposed the present navigation system on the Upper Mississippi River and transformed it into a river of grain.



## *Chronology of Events*

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### **1800-1850**

United States acquires legal claim to Upper Mississippi River valley through Louisiana Purchase (1803). Fort Snelling, a government outpost, established near present-day site of Minneapolis and St. Paul, Minnesota (1820s). First steamboat trip to Fort Snelling (1823). Steamboat commerce on the Mississippi River above St. Louis spurred by lead mining in Illinois and immigration into Minnesota.

### **1850-1870**

Period of greatest steamboat traffic on the Upper Mississippi River due to immigration and shipment of agricultural products, mainly wheat, to railheads on the river's east banks. First railroads built west of river.

### **1870-1900**

Railroads bridge river and draw most commerce from steamboats with the exception of white pine logs and lumber, which are rafted to mills and markets as far downstream as St. Louis. Rail network spreads across upper Midwest.

### **1900-1920**

Rising railroad rates prompt interest in restoring commerce to nation's rivers. New attitude toward water resources prompted by "conservation movement." Congress authorizes U.S. Army Corps of Engineers to establish navigation channel six feet deep on Upper Mississippi River (1907). Federal government initiates barge service on Mississippi River below St. Louis as part of response to World War I transportation problems.

### **1920-1930**

Commercial groups in Minneapolis and St. Paul promote navigation on Upper Mississippi River in response to rail rate decisions by the Interstate Commerce Commission. They succeed in drawing federal barge service to Twin Cities and committing the government to a navigation channel nine-feet deep on river between St. Louis and Twin Cities. Congress establishes Upper Mississippi River Wild Life and Fish Refuge (1924).

### **1930-1940**

Nine-foot channel project draws lukewarm support from Hoover administration during first years of economic depression. Project receives full support of Roosevelt administration and is completed as part of "New Deal" public works program at cost of \$164 million.

### **1940-1960**

Commerce on Upper Mississippi River grows steadily. Additional navigation projects initiated at four sites. Shipments of corn, soybeans and wheat begin to account for larger share of total river traffic in late 1950s.

### **1960-1980**

World grain trade expands dramatically and prompts rapid growth in shipments of corn, soybeans and wheat on the Upper Mississippi River until they account for half of all river traffic. Corps of Engineers examines all-year navigation and a deeper channel. Proposal for new lock and dam at Alton, Illinois, becomes national controversy (1974-1978). Congress authorizes construction of the \$420 million structure (1978).

### **1980-1985**

Traffic on Upper Mississippi River falters in response to global recession and deflation of world grain markets. Water freight industry complains of oversupply of barges. Corps of Engineers begins to examine rehabilitation of locks and dams in upper river navigation system.

### **1986**

Congress authorizes second lock in dam at Alton, Illinois, at cost of \$220 million.

# CHAPTER I

## *From the Ice Age to the Modern Era*

**T**he upper section of the Mississippi River is a magnificent aberration in a landscape flattened by ice. The advance of glaciers during the Great Ice Age levelled much of North America, and when global temperatures warmed, water that flowed from the melting ice carved new features into the land. The headwaters of the Mississippi River flow from terrain that was born of these terrific changes, and a deep gorge slices through this flattened landscape to carry these waters to the sea.

The glaciers of the ice age, an epoch known as the Pleistocene, formed as Earth's atmosphere cooled and unmelted blankets of snow froze solid.<sup>†</sup> Sea levels dropped as increasing amounts of the world's water were locked into ice sheets that spread over North America, Siberia and Scandinavia and eventually covered more than 25 percent of the world's land surface.<sup>1</sup>

The ice sheets, with their tremendous weight and force, shaped North America slowly but thoroughly. A column of ice one-foot square and 5,000 feet high would weigh more than 140 tons, and the glaciers, at their maximum, were 5,000 to 10,000 feet

thick and covered hundreds of thousands of square miles.<sup>2</sup> In the middle of the North American continent, the crushing weight of this ice transformed broad valleys into the Great Lakes.<sup>3</sup> Near Hudson Bay, at the center of the glacial sheet, the weight of the ice squeezed the Earth's crust toward the edges of the continent. Thousands of years later, the crust there is still springing back.<sup>4</sup>

The glaciers that sculpted North America began on the Laurentian Upland, a plateau of one million square miles that forms a grand arc around Hudson Bay.<sup>5</sup> Ice sheets radiated from this upland and over the North American landscape at least four times. The first glacial stage, the Nebraskan, began one million years or more ago as ice sheets spread from an area west of Hudson Bay and reached as far south as the lower Missouri valley.<sup>6</sup> Glacial till from this period—the deposits of rock, sand and silt left behind when the glacier melted—lie buried beneath the till of later glacial stages, indicating that subsequent ice sheets advanced to the limits of this initial glaciation and beyond.<sup>7</sup>

A warm period that followed the Nebraskan period gave way to a second

<sup>†</sup> Classical descriptions of the Pleistocene divide it into four major glacial stages—the Nebraskan, Kansan, Illinoian and Wisconsin stages—that were separated by warm interglacial periods. One estimate sets the time of the first glacial stage at 1.6 million years ago, the second stage at 900,000 years ago, and the third stage at 600,000 years ago (Academic American Encyclopedia, s.v. "Pleistocene Epoch," Vol. 15 [1983], pp. 364-6). More precise estimates using radiocarbon dating techniques set the beginning of the fourth glacial stage at 70,000 to 75,000 years ago (H.H. Lamb, *Climatic History and the Future* [Princeton, N.J.: Princeton University Press, 1985], pp. 333-335).

glacial stage known as the Kansan. During this period, ice covered much of the same range as the Nebraskan glaciers and may have created the Ohio River by overrunning an ancient river valley and diverting other streams south. The ancient watershed was buried by glacial till and is now a geologic relic entombed beneath the farmlands of central Illinois, Indiana and Ohio.<sup>8</sup>

Ice from the third, or Illinoian, glacial stage moved southwest over much of Illinois, Indiana and Ohio.<sup>9</sup> Further west, glacial ice apparently forced together three different streams to create the modern Missouri River. Geologists believe that Kansan and Illinoian ice blocked both a northern stream that flowed toward Hudson Bay and a stream further south that flowed across Iowa. Glacial ice diverted both streams south and forced them into the bed of a southern river that existed before the ice age even began, creating the "mud-foaming behemoth" that flows past St. Louis today.<sup>10</sup>

### Shaping the River

Each glacial episode influenced the Mississippi River, but much of the river's modern course formed during the Wisconsin period, the most recent glacial stage.

Evidence from Wisconsin glaciation suggests that each glacial stage was more than the advance and retreat of one monolithic ice sheet. Instead, each stage was a series of glacial pulses of varying strength, pulses that built up to a glacial "winter" and diminished during a glacial "spring."<sup>11</sup> The first of six glacial pulses during the Wisconsin stage began about 75,000 ago; the last one peaked about 20,000 years ago and ended about 13,000 years ago.<sup>12</sup>

During one such pulse, ice pushed into the Lake Superior basin and moved south toward the site of the cities of Minneapolis and St. Paul, Minnesota.<sup>13</sup> This "Minneapolis lobe" created a moraine—a long ridge of unsorted sand, gravel, silt and clay—that formed 100 miles of the modern Mississippi River channel between Minneapolis and the river's source in Lake Itasca. The river's headwaters wander away from Lake Itasca in



Map of Minnesota, Mississippi and St. Croix Rivers. The Falls of St. Anthony have moved eight miles upstream from the confluence of the Mississippi and Minnesota rivers since the end of the ice ages. Sediment deposited in the Mississippi River by the Chippewa River has formed Lake Pepin.

a wide arc that sweeps east and south until they reach the moraine left by the "Minneapolis lobe." There, the river turns south toward Minneapolis, following a trough that formed between the east edge of the moraine and the front of the melting ice lobe.<sup>14</sup> The river broke through this moraine north of Minneapolis and then cut its own path south toward the Minnesota River.<sup>15</sup>

The Minnesota River was once the "master stream" in the region, and it outclassed the Mississippi River during the Wisconsin glacial stage. During that period, the Minnesota River drained Lake Agassiz, a vast glacial lake that covered northwest Minnesota, parts of North Dakota and the Canadian provinces of Manitoba, Saskatchewan and Ontario. The St. Croix River drained Lake Duluth, a glacial lake that covered the western Lake Superior basin. The St. Croix River emptied into the Mississippi River about 30 miles downstream from the confluence of the Mississippi and Minnesota rivers.

Lakes Agassiz and Duluth formed when glaciers dammed rivers that ordinarily drained toward the north and east. When the glaciers retreated, Lake Duluth settled into

the basin now occupied by Lake Superior, and Lake Agassiz drained to the north, leaving remnants that formed Lake of the Woods and Lake Winnipeg. With the demise of the glacial lakes about 9,500 years ago, the tremendous flow of water through the St. Croix and Minnesota rivers disappeared, and the Mississippi River became the most important stream in the area. Waterfalls formed where the Mississippi River fell into the gorge carved by the Minnesota River. These falls, today known as the Falls of St. Anthony, moved eight miles up the Mississippi River as water chewed away at the river's rock channel.<sup>16</sup>

A magnificent valley, deeply incised into limestone, lies below the confluence of the Mississippi, Minnesota and St. Croix rivers. Mark Twain, writing in *Life on the Mississippi*, described it this way:

*The majestic bluffs that overlook the river, along through this region, charm one with the grace and variety of their forms, and the soft beauty of their adornment. The steep, verdant slope, whose base is at the water's edge, is topped by a lofty rampart of broken, turreted rocks, which are exquisitely rich and mellow in color—mainly dark browns and dull greens, but splashed with other tints. And then you have the shining river, winding here and there and yonder, its sweep interrupted at intervals by clusters of wooded islands threaded by silver channels . . . And it is all as tranquil and reposeful as dreamland, and has nothing this-worldly about it—nothing to hang a fret or a worry on.*

This "dreamland" is the beginning of a valley that extends 700 miles south toward the confluence of the Mississippi and Ohio rivers.<sup>17</sup>

For 230 miles below the St. Croix River, the Upper Mississippi River passes bluffs that reach up 400 feet. This stretch along Wisconsin's western border runs by the state's famous "driftless area," a rugged topographic island that escaped glaciation. The age and origin of the gorge in this region still elude geologists. Some believe that ice forced the river through this valley at the beginning of the Pleistocene in the same way that glaciers formed the Ohio and Missouri rivers; others suggest that the valley may

have been cut before the Great Ice Age even began.<sup>18</sup>

For about 60 miles south of the border between Wisconsin and Illinois, the Mississippi River wanders across the floor of a valley four to seven miles wide. This valley is actually a rock trench filled with as much as 300 feet of sediment, and the river carved 200-foot-high cliffs out of the valley walls as it meandered across the sediment surface.<sup>19</sup> The river follows this valley past bluffs near Savanna, Illinois, to the towns of Clinton, Iowa, and Fulton, Illinois.

The Mississippi River once followed a different course south of Fulton, flowing east and south across Illinois until it entered the channel of the modern Illinois River. Ice during the third glacial stage blocked this channel and created a glacial lake that drained through eastern Iowa. The new channel through Iowa joined a river valley south of Fort Madison, Iowa, that today forms part of the Mississippi River channel.<sup>20</sup> The diversion caused by Illinoian glaciers did more than just block the ancient Mississippi channel: The water forced around the face of the advancing ice cut through sediment and stone to excavate much of the present Mississippi River channel between Fulton and Muscatine, Iowa. As the third glacial stage dissipated, the Mississippi River returned to its former route through the Illinois River, but the fourth glacial stage once again pushed the Mississippi River west. Debris later filled the former channel through Illinois, and the Mississippi River turned toward the channel that formed during the third glacial stage, a channel it occupies today.<sup>21</sup>

The river flows across glacial sediment for 15 miles south of Fulton, Illinois, but it is on or near bedrock for the next 50 miles. This stretch begins at Cordova, Illinois, and continues past the cities of Davenport, Iowa, and Rock Island, Moline, and Bettendorf, Illinois. At Muscatine, Iowa, the river returns to a wide valley of glacial outwash bordered by steep bluffs.<sup>22</sup> Further south, the Mississippi River again crosses bedrock near the mouth of the Des Moines River at Keokuk, Iowa.

About 160 miles south of the Des Moines River, the Mississippi is joined by the Illinois

and Missouri rivers. Alluvial lowlands known as the American Bottom flank the river for the next 200 miles until it joins the Ohio River and enters a broad alluvial plain that extends 600 miles to the Gulf of Mexico. The river that loops back and forth across this plain is far different from the narrow and clear stream that flows out of Lake Itasca in northern Minnesota. Here the Mississippi is swollen with water and sediment from the Ohio and Missouri rivers and swaggering with its load across swaths of Louisiana, Mississippi, Arkansas and Tennessee. Without a steep slope to speed it along or narrow valley walls to confine it, the river has both the time and space to carve great looping channels out of the landscape. These meanders, which Mark Twain once compared to "a long, plant apple-paring," make the Lower Mississippi River 400 miles longer than the alluvial plain itself.

### ***The Glaciers Recede, Humanity Arrives***

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The glaciers did more than flatten landscapes and dig or destroy river channels. As they moved across the continent, the ice sheets altered the climate and ecology of North America. Coniferous and deciduous forests were compressed into narrow zones in the southeast. Prairies and grasslands were forced to the southwest. Tundra, the community of sparse vegetation that now rings the Arctic Ocean, was pushed far south of the Great Lakes. As the ice of the last glacial stage melted, the tundra zone retreated, prairie vegetation spread out over what is now the Great Plains, and coniferous and temperate deciduous forests moved north toward their present positions in the upper Midwest. Mammoths roamed the prehistoric North American prairies feeding on grasses, mastodons browsed on coarse vegetable matter in spruce forests, and homo sapiens roamed prairie and forest alike, feeding on the giant mammals.

Spear tips and skeleton parts indicate that humans hunted the great creatures of the Mississippi River valley 10,000 years or more ago.<sup>†</sup> These people apparently were nomadic, judging by the presence of some physical evidence, such as fluted spear points, and the absence of other physical evidence, such as graves or permanent village sites. By about 6,000 B.C. they may have penetrated most of the Upper Mississippi River valley, and the remains of a bison kill indicate that they reached Lake Itasca, the very source of the Mississippi River, by about 5,000 B.C.<sup>23</sup>

These ancient societies became increasingly complex, as evidenced by their ceramics and mortuary practices. People began to bury their dead with artifacts made as grave offerings, a practice that suggests social specialization to allow manufacture of such items and elaborate concepts of death and an afterlife.<sup>24</sup> Beginning about 1000 B.C., these ancient people also started to bury their dead in earthen mounds.<sup>25</sup> Members of the Marion culture, which existed from about 700 B.C. to 400 B.C., may have built the burial mounds that still stand near the Upper Mississippi River in northeast Iowa and southwest Wisconsin.

Perhaps the most spectacular remnants of prehistoric culture along the Mississippi River are the huge earthen mounds that stand near St. Louis and just south of the river's confluence with the Missouri River. These mounds are the remains of the prehistoric metropolis of Cahokia, an urban settlement that began 1,000 years ago and was once home to 5,000 people or more.<sup>26</sup>

Cahokia was the largest settlement of the Mississippian culture, a society that developed around 700 B.C. on Mississippi River floodplains between the Missouri and Ohio rivers. Fertile soil allowed Mississippian people to grow maize, beans, squash, pumpkins, gourds and sunflowers, and good crops encouraged stable communities as well as population growth, trading, labor specialization and religious practices that focussed on crop production.<sup>27</sup>

† Sea levels dropped during the Pleistocene and exposed dry land between Alaska and Siberia. Humans apparently used this land bridge to migrate to North America about 20,000 years ago.

Cahokia itself may have been one of the most densely populated areas in the eastern United States between 700 A.D. and 1700 A.D. A natural ridge that formed the main axis of the five-square-mile site was lined with one hundred earthen mounds, and an earthen mound 100 feet tall, the largest human construction north of Mexico, towered over "downtown Cahokia." These and other flat-topped mounds in Cahokia apparently were foundations for public buildings or residences of Cahokia's elite.<sup>28†</sup>

Less complex agricultural societies inhabited the Upper Mississippi River during the rise and fall of Mississippian culture. The Black Sand culture, which lasted from about 400 B.C. to 100 B.C., was among the first to intensively exploit floodplains of the Upper Mississippi River. The Havana culture, which existed from about 400 B.C. to about 400 A.D., was strongly established along the Illinois River but also reached up the Mississippi River to its confluence with the Minnesota River.<sup>29</sup> It was part of a vast trade network that dealt in copper from the Lake Superior region, conch shells from the Gulf of Mexico, mica from the Appalachian Mountains in North Carolina, and obsidian and grizzly bear teeth from Wyoming.<sup>30</sup>

One of the most pervasive of these ancient societies was the Oneota culture, which appeared about 1050 A.D. and reached from Lake Michigan onto the Great Plains. People of the Oneota culture lived in large permanent villages, grew corn and supplemented their diet with hunting and gathering.<sup>31</sup> Although their culture lasted until about 1650 A.D., some large Oneota settlements had fragmented into small, dispersed communities by 1400 A.D.<sup>32</sup> The forces that disrupted the Oneota culture apparently shuddered through much of the Upper Midwest, for a chaotic period began

around 1400 A.D. that was marked by tribal disintegration, mass migrations and near total human abandonment of vast regions around the upper Great Lakes.<sup>33</sup>

Greater social disruptions were to come. Unlike earlier disturbances, these new upheavals would be recorded for history by the European explorers who were probing the Great Lakes and the Upper Mississippi River valley. The economic, political and military goals of these foreign societies would, in time, undermine the native cultures of the region.

### ***The Era of Exploration***

A French explorer and a Jesuit missionary were the first Europeans to reach the Upper Mississippi River. Father Jacques Marquette was travelling with the expedition of explorer Louis Jolliet in the summer of 1673 when they entered the Mississippi after negotiating canoes down the broad and sandy Wisconsin River. Marquette's diary described their expedition as it continued past the mouth of the Missouri River, which boiled with "a tangle of large trees, branches and floating islands," and ended near Arkansas.<sup>34</sup> The party eventually returned north by way of the Illinois River and Lake Michigan.<sup>35</sup>

Jolliet and Marquette were just part of a wave of new French expansion into North America. French explorers first reached the Great Lakes in 1615 and reached western Lake Superior by the 1660s, bringing with them missionaries and markets for furs.<sup>36</sup> As they established forts, trading posts and missions around the Great Lakes region, the French profoundly influenced the native people.<sup>††</sup> Jesuit missions became economic

† Some estimates of Cahokia's population run as high as 30,000. Cahokia's residents built a solar observatory that used wood stakes arranged in large circles—a "woodhenge"—to establish an accurate calendar by tracking the sun's movement (George Armstrong, "Cahokia's 'Woodhenge,'" *Early Man* [Spring 1979], pp. 6-7).

†† The Ioway and Dakota people who inhabited the Upper Mississippi River valley during this period may be descendants of the Oneota culture, and Illinois people may be inheritors of the Mississippian culture. Many of the other historic tribes—the Miami, Sauk, Fox, Potawatomi, Kickapoo and Ojibwa—were relatively recent migrants to the region from the east (James B. Stoltman, "Ancient Peoples of the Upper Mississippi River Valley," in *Historic Lifestyles in the Upper Mississippi River Valley* [Lanham, Md.: University Press of America, 1983], pp. 242-3).

and social centers as various Indian bands and tribes gravitated toward them, urged to do so by traders and missionaries. These native groups began to lose their distinct identities as they mingled at the missions and as French priorities and trade began to dominate their activities.<sup>37</sup>

Distant political powers and contests became increasingly important to the fate of the Upper Mississippi River valley during the 1600s and 1700s. The French were most active on the Great Lakes during this period, but French soldiers and traders also erected and occupied 10 forts on the Upper Mississippi River and its tributaries.<sup>38</sup> France lost its influence in the region during the 1750s as it fought with England in North America during the French and Indian War and in Europe during the Seven Years' War. By the early 1760s, when the wars were over, France had lost its territory east of the Mississippi to Britain and its territory west of the Mississippi to Spain.<sup>†</sup>

British interest in the western lands went beyond religious proselytizing and fur trading: It included colonization and exploitation of timber, minerals and farm land.<sup>39</sup> Britain's presence in the region was cut short, though, by the successful revolt of its colonists on the Atlantic seaboard. With the 1783 Treaty of Paris, Britain surrendered jurisdiction over territory between the Appalachian Mountains and the Mississippi

River to the government of the new United States of America.<sup>40</sup> Twenty years later, the United States extended its legal claims beyond the Mississippi River when it bought the Louisiana territory from France.

In 1805, Zebulon Pike, a lieutenant in the U.S. army, made one of the first attempts to assert jurisdiction over the upper reaches of the Mississippi River valley. Pike travelled to the confluence of the Mississippi and Minnesota rivers and bought land there from the local Sioux tribes.<sup>††</sup> The site later became Fort Snelling and was the extreme northwest outpost of the U.S. military.

During the 1800s, many of the settlers who moved into the upper Midwest traveled the ancient gorge of the Upper Mississippi River to Fort Snelling. Some settled nearby in the communities of St. Paul, Minneapolis and St. Anthony. Others took axes and saws into northern Wisconsin and Minnesota to cut the forests of white pine. Many more took plows onto the prairies to rend the sod and replace the prairie grasses with wheat. As lumber millers, flour millers, grain merchants and railroad executives followed these settlers, the priorities of business and bureaucracy began to mix with the flow of the Upper Mississippi River. Sometimes these priorities affected only the numbers at the bottom of accounting forms; other times they shaped the river as only water and weather and gravity had done before.

† A French explorer, Robert Caveller, claimed the entire Mississippi River basin in the name of Louis XIV in 1682. France ceded lands west of the Mississippi to Spain in 1762 as compensation for Spanish support of a French war with Britain during the 1750s. French lands east of the Mississippi passed to the British in the Treaty of Paris of 1763. France regained the Louisiana territory from Spain in 1800 by treaty, but sold the territory in 1803 to the United States for \$15 million to finance an impending war with Britain (Encyclopedia Americana, s.v. "Louisiana Purchase," Vol. 17 [1985], pp. 799-800). The purchase gave the United States title to land between the Mississippi River and the Rocky Mountains.

†† Western lands were considered "conquered" and available for settlement by U.S. citizens, although some land was allotted to "conquered" Indian inhabitants (Lyle M. Stone and Donald Chaput, "History of the Upper Great Lakes Area," in *Handbook of North American Indians*, Vol. 15 [Washington: Smithsonian Institution, 1978], p. 607). Agreements between the U.S. government and native people usually were in the form of treaties and land cessions. Among these agreements were an 1804 treaty in which the Sauk and Fox relinquished claims to land east of the Mississippi, a treaty which prompted an unsuccessful Indian rebellion—the Black Hawk War—in 1832; treaties of 1837 and 1842 between the United States and the Ojibwa tribes which involved major land cessions in Wisconsin and Michigan; and the 1851 treaty of Traverse des Sioux that ceded Dakota land in Minnesota to the United States (J. Joseph Bauxar, "History of the Illinois Area," in *Handbook of North American Indians*, Vol. 15, p. 598; Louis B. Casagrande and Orrin C. Shane III, "The Historic Tribes of the Upper Mississippi River Valley" in *Historic Lifestyles in the Upper Mississippi River Valley* [Lanham, Md.: University Press of America, Inc., 1983], pp. 263-4).

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## CHAPTER II

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### *Farms and Factories, Railroads and the River*

**D**uring the nineteenth century, the Upper Mississippi River served many needs of U.S. agriculture and industry. From the 1820s through the 1840s, the river carried lead from mines in Wisconsin and Illinois to markets in St. Louis. During the 1850s and 1860s, it guided immigrant farmers toward the vast prairies of Minnesota and the Dakotas. And after the Civil War, it carried timber downstream to sawmills as lumberjacks felled the great pine forests of Wisconsin and northern Minnesota. The river's commercial value was destined to fail, though, because in the context of national and international trade, it ran the "wrong way."

In the mid-1800s, midwestern commerce was oriented not to the south but to the east. Growing markets for food in the metropolitan northeastern United States and in Great Britain, the world's "industrial dynamo," had spurred agricultural development in the Midwest, and the region's produce flowed east across the Great Lakes and Erie Canal, a route shorter than the path down the Mississippi River, across the Gulf of Mexico and up the Atlantic coast. The nation's railroads reached the Upper Mississippi River valley in the 1850s, and as tracks lined the banks of the Upper Mississippi River and crossed its channels and sloughs, they choked river commerce with the steel threads of a rapidly maturing industrial economy.

On the Upper Mississippi River, the declining importance of waterborne

commerce was hidden by the rafting of logs and lumber from the pineries of northern Wisconsin and Minnesota. Decades of unrestrained logging inevitably wasted the once fantastic stands of timber, and when the pineries were gone, so was the demand for streamboat transportation. Despite this absence of traffic, Congress would spend millions of dollars after the Civil War to support commerce on the Mississippi and other rivers. The railroads, however, had claimed their central position in the nation's transportation network, and Congressional appropriations for navigation projects often smelled more of pork than practicality.

#### ***Waterways and National Economic Development***

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Waterborne commerce was vital to the nation's economy and politics at the time the United States assumed jurisdiction over the Mississippi River valley and other territory west of the Appalachian Mountains. However, the United States of the early 1800s was a "tidewater republic," not a "continental empire," and most of that commerce was east of the Appalachians.<sup>1</sup>

Agriculture was the main source of income for more than 90 percent of the nation's population during the late 1700s and early 1800s, and agricultural markets were concentrated in small cities on the

Atlantic coastal plain and piedmont plateau. Because produce was frequently shipped by water, agricultural zones extended up river valleys, and cultivation ended on the eastern Appalachian slope where rivers became too turbulent for navigation.<sup>2</sup>

Farmers west of the Appalachian Mountains had limited access to the eastern markets due to the high cost of shipping goods over the Appalachians or down the Ohio and lower Mississippi rivers and through the Gulf of Mexico. During the early 1800s, markets in the East and populations in the West both grew, and the improvement of transportation routes in and between these two regions became a national issue.

During the first decade of the nineteenth century, politicians demanded and received federal support for "internal improvements." In 1802, for example, Congress carved Ohio out of the Northwest Territory with an act that allotted five percent of revenue from public land sales to road construction.<sup>3</sup> In 1806, Congress authorized construction of the National Road, also known as the Cumberland Road, from Cumberland, Maryland, toward the Mississippi River. In 1807, the Senate authorized Secretary of the Treasury Albert Gallatin to compile a plan for building a nationwide network of roads, canals and waterways at public expense.<sup>4</sup> Gallatin's report, presented in April 1808, described a transportation network that would promote economic development of territories west of the Appalachian Mountains, encourage political unity and bolster national defense.<sup>5</sup> It also put its weight behind federal support of transportation improvements, regardless of potential returns on the investments.

Despite Gallatin's vision of a nation crossed by turnpikes and canals, proposals for internal improvements fomented political dissent instead of forming a national objective. The debate centered around the

constitutionality of federal support for such projects. Broad constructionists argued that federal actions such as the Louisiana Purchase set precedents for financing projects not specifically described in the Constitution, but strict interpreters of the Constitution argued that the central government lacked the authority to undertake public works. Even President Thomas Jefferson, who supported federal improvements, believed a constitutional amendment was needed before the federal government could pay for them.<sup>6</sup> This controversy was unresolved in 1824, when Congress passed the General Survey Act authorizing comprehensive surveys by army engineers for road and canal routes and other projects the president judged to be in the national interest.<sup>7†</sup> Construction and operation of these improvements were left to the jurisdiction of the states.<sup>8</sup> (The act also formalized the use of U.S. military engineers on public works. In 1802, Congress authorized the creation of a small corps of engineers to be stationed at a military academy at West Point, New York. After 1824, Army engineers used their expertise to survey roads and railroads and to modify rivers and harbors for navigation.<sup>9</sup>)

While Congress grappled with constitutional issues, the construction of the Erie Canal and the development of steamboat commerce were reshaping the nation's network of trade and transportation.

The Erie Canal opened western New York state and much of the Midwest to commerce and agricultural development by connecting the city of New York to the Great Lakes, and after it opened in 1825, it prompted shipping in volumes that have been compared to "the torrent from a bursting dam."<sup>10</sup> The canal followed the Mohawk River valley, the only natural break in the Appalachian Mountains between Georgia and Maine. (This gap through the mountains in upstate New York

† Federal support of "improvements" on rivers west of the Appalachian Mountains, especially on the Ohio and Mississippi rivers, was less controversial than that for other public works proposals, perhaps because the rivers formed boundaries between at least nine states. For example, Congress authorized \$75,000 in May 1824 for removal of sand bars and snags on the Ohio and lower Mississippi rivers, its first substantial appropriation for navigation projects on the western waters (Edward L. Pross, "A History of Rivers and Harbors Appropriation Bills" [Ph.D. diss., Ohio State University, 1938], pp. 26-27; Louis C. Hunter, *Steamboats on the Western Rivers* [Cambridge: Harvard University Press, 1949], p. 191; 4 Stat. 32).

runs between the Hudson River valley on the east and lowlands to the west.) During its first 20 years, the canal's most immediate commercial benefit was the access it gave wheat growers in western New York and northern Ohio to eastern markets. Low transportation costs on the canal, coupled with high wheat prices during the late 1820s, made western New York the center of the U.S. wheat belt and transformed Rochester, New York, into a major milling center.<sup>11</sup> Not only was the canal itself successful, but it also spurred the construction of more canals on both sides of the Appalachian Mountains.

The Erie Canal's impact on transportation was equalled by that of the steam engine, an innovation patented by James Watt in 1769. Steamboats harnessed this power source inside vessels of shallow draft, and they proved well suited to North America's twisted and shallow inland rivers, where sails were of little use and upstream travel demanded great physical effort.<sup>12</sup> Robert Fulton, an inventor, and Robert Livingston, one of the authors of the Declaration of Independence, were among the first to build and operate steamboats on the nation's rivers: In October 1811, they brought the new age of transportation to rivers west of the Appalachian Mountains when they launched the *New Orleans* at Pittsburgh. Other entrepreneurs quickly entered the business, primarily on the Ohio and Lower Mississippi rivers, and by 1819 about 30 steamboats plied the western rivers, especially the Ohio-Mississippi route between Louisville, Kentucky and New Orleans.<sup>13</sup>

### ***The Upper Mississippi River and Regional Economic Development***

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During the first two decades of steamboat commerce on western rivers, traffic developed slowly on the Mississippi River above the mouth of the Missouri River, a consequence of the relative remoteness of the Upper Midwest and of obstructions posed by rapids near the mouths of the Des Moines and Rock rivers.<sup>14</sup> The first steamboat that

passed these rapids was the *Virginia*, which travelled to the confluence of the Minnesota and Mississippi rivers in 1823 with supplies for Fort Snelling. This military outpost would eventually become the center for the largest metropolitan area to the north of St. Louis. In the 1820s, though, commercial action on the Upper Mississippi River was 250 miles to the south, in northwestern Illinois and southwestern Wisconsin, where rich lead deposits were prompting a rush of immigration and the first regular steamboat traffic on the upper river.

Federal mining leases on in the region were first granted in 1822 and 1823, and steamboats soon were hauling supplies and miners upriver and lead shipments downriver to St. Louis, the main market for the metal. Galena, Illinois, located seven miles up the Fever River from the Mississippi, was the center of the lead trade and had regular steamboat connections with St. Louis by 1827.<sup>15</sup> Lead was the most important commercial load for steamboats on the Upper Mississippi River until the late 1840s, when easily accessible ore deposits ran out and miners drifted into other regions or occupations.<sup>16</sup> Then, during the 1840s and 1850s, the cities of St. Paul, St. Anthony and Minneapolis began to draw river traffic north.

The three Minnesota communities took root near a natural break in navigation on the Upper Mississippi River, a waterfall that first formed at the confluence of the Mississippi and Minnesota rivers but eroded its way eight miles up the Mississippi channel since the end of the ice age. (Father Louis Hennepin, a Franciscan priest who was the first French explorer to reach the site, named this precipice the Falls of St. Anthony after his patron saint.) The falls were a source of power for lumber and flour mills in the growing cities of St. Anthony, located on the fall's east bank, and Minneapolis, located across the river.<sup>17</sup> Several miles downstream, the city of St. Paul developed as a distinct commercial center.<sup>18</sup> A small store in a log cabin was one of St. Paul's only businesses in 1842, but the community was booming by the end of the decade. A newspaper article published in April 1849 said:

*A description of the village now would not answer for a month hence—such is the rapidity of building. . . Piles of lumber and building materials lie scattered everywhere in admirable confusion. The whole town is on the stir—stores, hotels, houses are projected and built in a few days. California is forgotten and the whole town is rife with the exciting spirit of advancement.*<sup>19</sup>

Steamboat business on the Upper Mississippi River thrived during the 1850s as waves of immigrants moved into Iowa, western Wisconsin and Minnesota.<sup>†</sup> Many settlers arrived by rail at the banks of the Upper Mississippi River and then traveled by steamboat to St. Paul. The Chicago and Rock Island Railroad connected Chicago with the Mississippi River town of Rock Island in 1854, prompting a surge of immigrants to St. Paul over the rail-water route.<sup>20</sup> Immigration into Minnesota swelled during the decade after treaties with the Sioux tribes, especially the 1851 treaty of Traverse des Sioux, opened the southern third of the territory for settlement. In 1850, the population of the Territory of Minnesota was about 6,000; in 1860, the population of the State of Minnesota was more than 170,000.<sup>21</sup>

These settlers were at the crest of a wave of immigration that swept over the Midwest in the 1840s and 1850s and spread onto the Great Plains. They established an agriculture that was based largely on one crop—wheat. It required relatively little labor, a scarce resource on the frontier; it could be eaten, stored or shipped; and it had a reasonably assured market, especially in the east.<sup>22</sup> By the 1840s, U.S. wheat production extended as far west as northern Indiana and Illinois and southeastern Wisconsin.<sup>23</sup> During the 1850s, Wisconsin became one of the top 10 wheat-producing states in the nation.<sup>24</sup> Minnesota also became an important producer, and by the late 1850s, Minnesota towns along the Mississippi River were shipping hundreds of thousands of bushels of wheat south. (Minnesota had no rail

connections with the east, so wheat traders, like the fur traders before them, exported their produce by water.)

Ports on the Mississippi, Minnesota and St. Croix rivers opened water routes to the two most important markets for Minnesota wheat—St. Louis, a major milling center, and Milwaukee, a leading port for Great Lakes grain shipping.<sup>25</sup> Among the river towns in Minnesota that figured in the wheat trade during the late 1850s and the 1860s were Stillwater on the St. Croix River; Mankato and St. Peter on the Minnesota River; and St. Paul, Hastings, Red Wing, Wabasha, Winona, and Brownsville on the Mississippi River. (Another important Mississippi River town was McGregor, Iowa, located about 215 miles downstream from St. Paul.)<sup>26</sup>

The wheat trade on the Mississippi River existed mainly between these river ports and railheads along the east bank of the river between La Crosse, Wisconsin, and Dunleith, Illinois. This trade was lively during the Civil War, but it weakened after 1867, when railroads began to cross the river and tap into the farm fields of Iowa and Minnesota.

### ***Changes in National Commerce***

Burgeoning commerce on the Upper Mississippi River during the 1850s masked a decade of decline for the steamboat business as a whole.<sup>27</sup> Steamboat disasters, such as boiler explosions and fires, weakened public confidence, and prolonged disruptions caused by periods of low water discredited steamboat transportation with commercial shippers. The growing competition steamboats faced from railroads and Great Lakes shippers added to these problems. By the 1860s, commerce on the Great Lakes and Erie Canal had effectively outflanked the Appalachian Mountains and turned trade away from the Ohio and Mississippi rivers. The Erie Canal had linked New York City with New York State's western wheat fields in

<sup>†</sup> Annual steamboat arrivals in St. Paul averaged 280 during the first half of the 1850s, more than four times the yearly average of the late 1840s, and they peaked at 1,068 in 1858 (Louis C. Hunter, *Steamboats on the Western Rivers* [Cambridge: Harvard University Press, 1949], p. 45).

1825, and by mid-century it had turned the entire Great Lakes region into New York City's inland tributary. Completion of the Erie Canal was but one in a series of blows that demolished the costly Mississippi-Gulf-Atlantic trade route between eastern and western markets. Between the 1820s and 1850s, canal construction across Ohio, Indiana and Illinois linked the Ohio, Illinois and Mississippi rivers with Lakes Erie and Michigan. The commercial influence of Great Lakes ports—particularly Cleveland, Toledo, Chicago and Milwaukee—reached inland by way of canals and rail lines, and vast territory that once had trade outlets only to the south fell within reach of Great Lakes shipping.<sup>28</sup> By the beginning of the Civil War, canals also tied the Great Lakes together and allowed commercial navigation from the Atlantic Ocean to the head of Lake Superior at Duluth, Minnesota.<sup>29</sup>

Railroads reached west from Chicago and Milwaukee during the 1850s, making the two cities magnets for the agricultural produce of the Midwest and major outlets for manufactured products from the Northeast. Barges or lake schooners hauled grain from Chicago and Milwaukee to the east and brought back goods made in the Northeast or imported through ports such as New York, Boston, Philadelphia and Baltimore.<sup>30</sup> Railroads from Chicago and Milwaukee also tapped into steamboat trade on the Upper Mississippi River and drew it east.<sup>31</sup> In 1855, the Illinois Central line arrived at the river town of Dunleith, near Galena, and deflected wheat and flour shipments toward Chicago. The Milwaukee and Mississippi railroad reached Prairie du Chien, Wisconsin, in 1857; the La Crosse and Milwaukee line reached La Crosse in 1858, and both funneled Minnesota produce to the port and markets of Milwaukee.<sup>32</sup> Beginning in the late 1860s, railroads began to span the river itself and tie directly into the wheat fields of Minnesota and the Dakota territory.

The advantages that railroads had over steamboats were many and varied, but their most basic advantages lay in their freedom from interruptions due to weather and their ability to spread across the landscape. The pace of the nation's economy had accelerated during the middle of the nineteenth century,

and shippers had become impatient with steamboat traffic and its domination by weather. Railroads were not idled by ice on frozen rivers or low water levels caused by drought: They could carry passengers and freight in all seasons, regardless of the weather.<sup>33</sup> And they were not bound to riverbeds. That freedom was not important when trade was concentrated along riverbanks, but as settlers and settlements moved inland, the railroads were best at meeting their commercial needs.<sup>34</sup> Spur tracks and sidings brought railroad service to the very doors of factories, mills and warehouses, a service that made steamboat landings appear primitive and inefficient in comparison.<sup>35</sup> Railroad service also was fast and followed regular schedules as long as the traffic paid operating costs. This regularity, a marked contrast to the chaotic steamboat business, was a boon to merchants: It eliminated the need to buy large stocks at infrequent intervals, a practice that was common when high water determined steamboat schedules.<sup>36</sup>

### *The Civil War and its Aftermath*

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War broke out between the industrial north and the agricultural south in 1861. After four years of fighting, the South was ruined and old trade routes and concepts about transportation were shattered. A blockade of the lower Mississippi River during the war permanently drove traffic to new trade routes, and cities on the Atlantic coast eclipsed New Orleans as ports. The defeat of the Confederacy also confirmed the dominance of the federal government in national affairs and ended debate over the constitutionality of federal work on internal improvements. The end of this debate gave rise to a "Golden Age of Pork Barrel" during which Congress freely authorized funds for river projects despite the steady decline in river commerce after the Civil War.<sup>37</sup>

The railroad network that spread across the continent during the middle of the nineteenth century was concentrated in the northern states. By 1860, the eastern third of the nation had 30,000 miles of track;

two-thirds of that mileage was in northern states and it was isolated from the South by the Ohio River. Wartime demands in the North and widespread destruction in the South strengthened the dominance of both the northern railroads and their orientation to the east.

The post-war orientation of national and international commerce was the subject of a Senate committee investigation during the early 1870s. The committee, headed by U.S. Senator William Windom of Minnesota, directed its attention at "various enterprises for the more certain and cheaper transportation of the constantly increasing Western and Southern products to the Atlantic seaboard."<sup>38</sup> The Windom committee's report noted that economic repercussions of the Civil War destroyed old commercial powers and trade routes even as they created and reinforced new ones. The "rebellion crippled and paralyzed the South, while the war electrified and strengthened the commercial interests of the North," the report said. "Capital, unable to find safe employment at New Orleans, sought the ports of the North, and by the construction of railroads and ships, new channels of commerce were created and old channels enlarged and improved."

Such shifts in capital could not be ignored.

"Money is a magnet of wonderful power," the report said. "Both ships and merchandise obey its imperious mandates."<sup>39</sup>

The strong orientation of post-war trade to the east was encouraged, in part, by basic problems with New Orleans as a port and the entire Mississippi River as an avenue of

trade. Rapids near the mouths of the Des Moines and Rock rivers hampered traffic between New Orleans and communities north of St. Louis, and ice often blocked the Upper Mississippi River for half the year. When steamboat owners rushed to get returns on their investments during the months of open shipping, they often glutted New Orleans with produce that spoiled because of inadequate storage and the city's hot, humid weather. Ports on the northeastern Atlantic coast also had better facilities and better access to the sea than New Orleans, which lay about 100 miles up a twisting channel through the Mississippi River delta. The channel was difficult to navigate at any time, but its relatively shallow depth also blocked the newer, deeper-draft steam vessels that were taking ocean shipping away from sailing ships. Atlantic ports had another advantage in that their high volumes of imports made massive amounts of tonnage available for exports.<sup>40</sup>

Grain, especially wheat, figured strongly in the Windom committee's inquiries. Wheat served as a useful marker of the nation's internal trade routes, for it was a basic element of both frontier agriculture and northeastern agricultural markets. Northeastern states not only consumed large amounts of wheat; their ports also handled shipments to Britain, where bread was becoming as important as coal in fuelling the industrial revolution.<sup>41</sup> A growing appetite for meat also increased Britain's imports of feed stuffs, especially corn.<sup>42†</sup>

The committee also reported that domestic and foreign markets drew 83 percent of surplus U.S. grain east over the railroads, the Great Lakes, and canals in

† British demand for agricultural products had begun to outstrip domestic supplies during the middle of the nineteenth century. At the same time, links between British markets and U.S. production tightened as a consequence of transportation improvements, such as the use of steamships on the Great Lakes and Atlantic Ocean, that cut freight rates from the northern Great Plains to eastern and foreign markets (John Richard Peet, "The Spatial Expansion of Commercial Agriculture in the Nineteenth Century [Ph.D. diss., University of California-Berkeley, 1968], p. 103, 126-128, 291-304). From 1860 to 1872, U.S. wheat accounted for 28.5 percent of Britain's wheat imports. Although exports to Britain amounted to only 3 percent of annual grain production in the United States, those exports strongly influenced grain prices in U.S. markets. Grain prices "are regulated almost absolutely by the ruling prices in Liverpool and London," the Windom committee reported. "Since the telegraph has become so potent an agent in commercial transactions, the daily fluctuations of wheat and corn at the great grain markets of England cause corresponding fluctuations at Montreal, at New York, at Buffalo, at Chicago, and at every market in the United States" (U.S. Congress, Senate, *Report of the Select Committee on Transportation Routes to the Seaboard*, 43d Cong., 1st sess., 1874, S. Rep. 307, pt. 1, p. 45).

New York and Canada. The remaining 17 percent of surplus U.S. grain was shipped south by way of the Mississippi River and railroads that linked western states to states on the Gulf of Mexico.<sup>43</sup>

"No elaborate computations are necessary in order to show that the cost of transporting the surplus products of the West to markets of the North Atlantic States by the Erie Canal and railroads from the West to the East must be much less than would be the cost of transporting such products to ports on the Mississippi River, thence to New Orleans, thence to Atlantic seaports, and thence by rail or water to interior points," the committee report said.<sup>44</sup>

Railroads carried much of these post-war grain shipments: They had discovered enough profit in grain shipping to make it a distinct part of their operations, and by the mid-1870s, they hauled two thirds of the grain that was shipped east.<sup>45</sup> In addition, railroads also handled much of the commerce for communities that had moved inland and for businesses in river towns that no longer were concentrated on waterfronts.

Changes in transportation needs and inherent differences between railroads and steamboats contributed to the demise of waterborne commerce in the Mississippi Valley after the Civil War. Cut-throat competition for traffic on the rail lines also figured into this development. During the 1860s and 1870s, long-haul interstate commerce became increasingly important, and railroads used secret rates, rebates, concessions and other discriminatory measures to fight each other for this trade. A financial depression in 1873 contributed to the desperation of this contest.<sup>46</sup> The ferocity of the competition affected steamboat business as railroads lowered rates along rivers to draw traffic to the rails.<sup>47</sup>

In its analysis of U.S. transportation and trade, the Windom committee addressed some of these problems with the railroads and went on to enunciate new federal policy toward inland water transportation. The Windom committee acknowledged that railroads had been accused of "insufficient facilities, unfair discriminations, and extortionate charges."<sup>48</sup> In response, the committee recommended that Congress

require railroads to publish rates and avoid combinations and consolidations. The committee held that "Federal power" may be used to maintain commercial equality between states, to prevent unfair discriminations and to restrain "consolidated corporate power" and correct "its existing evils." However, it also said "the desired object—cheap transportation"—could be attained only by competition, not legislation.<sup>49</sup> Its report blandly proffered government railroads as an option for cheaper transportation. Then, it wholeheartedly endorsed waterways as "the natural competitors, and most effective regulators of railway-transportation . . . . The above facts and conclusions, together with the remarkable physical adaptation of our country for cheap and ample water-communications, point unerringly to the improvement of our great natural water-ways, and their connection by canals, or by short freight-railway portages under control of the Government, as the obvious and certain solution of the problem of *cheap transportation*."<sup>50</sup>

Such endorsements seasoned funds that Congress ladled from the pork barrel after the Civil War. Between 1866 and 1883, Congress made 16 appropriations for rivers and harbors projects in legislation marked by hasty enactment, poor choices, piecemeal appropriations and "logrolling," the mutual aid legislators give each other during votes on numerous items of importance in individual states and districts.<sup>51</sup> This rash of appropriations was much different than the federal approach toward rivers and harbors work before the Civil War. Congress had been restrained earlier by constitutional questions and, as a consequence, authorized little money for work on inland waterways. Even when Congressional coalitions were strong enough to authorize navigation projects, such legislation was a prime target for presidential vetoes.<sup>52</sup>

However, Congress had installed the "fundamental machinery" for rivers and harbors legislation before the Civil War, and many hands put this machinery into gear in the post-war period. Appropriations for projects were frequently bent toward local commercial and political aims, not national



goals, and their approval depended more on political influence and local enthusiasm than statistical evidence.<sup>53</sup> Congressional committees allocated funds widely to avoid political opposition or crippling amendments but kept total appropriations low to avoid criticism and veto threats. As a result, committees gave small appropriations to a large number of projects, a piecemeal method that was wasteful and unwise but common to almost every act until 1890.<sup>54</sup>

Supporters of rivers and harbors projects leaned heavily on arguments that waterways were "natural competitors and regulators" of the railroads even after passage of the Interstate Commerce Act, legislation that was aimed not at reducing rail rates but at preventing discriminatory rates.<sup>55</sup> Politicians monotonously cited old arguments that water transportation helped control rail rates and had superior economy over railways, and as a result, projects that offered little or no hope of substantial commerce were funded only with the hope that such work would help keep railway rates down.<sup>56</sup> This approach may have delayed federal regulation of the railroads, and millions of dollars may have been wasted in a futile attempt to control rail rates.<sup>57</sup>

### ***Changes in Commerce on the Upper Mississippi River***

The blockade of the lower Mississippi River during the Civil War did little to upset the economies of the northern states along the river. An editorial in the *Milwaukee Sentinel*, printed in January 1863, expressed this lack of concern when it described "how insignificant is the value of the lower Mississippi to us of the West, as compared

with the communications which terminate at the East." The editorial concluded that states of the old Northwest had no common interests with the Confederacy, and that the future of the northern states lay with New York City and the East, not with New Orleans and the South.<sup>58</sup> (The blockade ended in July 1863 after Union troops captured Vicksburg, Mississippi, the most important Confederate outpost on the lower Mississippi River.)

The editorial accurately defined the orientation of Midwestern trade toward the east, the importance of the Midwest's expanding rail network, and the rapidly declining commerce of the Upper Mississippi River. However, these commercial realities did not prevent Congress from taking a dollop from the pork barrel and applying it to projects on the upper river after the Civil War. In the rivers and harbors act of 23 June 1866, Congress authorized funding for almost 50 projects, including the first permanent navigation works on the Upper Mississippi River.<sup>59</sup> The act provided \$200,000 for work on the Des Moines Rapids, \$100,000 for work on the Rock Island rapids, and \$100,000 for other work north of St. Louis.<sup>†</sup> The Corps of Engineers began work on both the Des Moines and Rock Island rapids in the fall of 1867.<sup>††</sup>

The Des Moines rapids extended about 11 miles upriver from Keokuk and the mouth of the Des Moines River, and the Corps circumvented them with a canal and locks along the Iowa side of the Mississippi. The project cost more than \$4 million, employed up to 1,600 and lasted 10 years.<sup>60</sup> Further north, the Corps spent about 20 years carving a channel through the Rock Island rapids, seven chains of rocks that crossed the river in a 14-mile stretch above Rock Island, Illinois. Most of this project was

† The Corps of Engineers opened its first district offices along the Upper Mississippi River in 1866. The St. Paul district was charged with surveying the upper river and its tributaries. The district office in Keokuk, Iowa, which was transferred to Rock Island, Illinois, in 1870, was responsible for work at the Des Moines and Rock Island rapids (Raymond H. Merritt, *Creativity, Conflict and Controversy: A History of the St. Paul District, U.S. Army Corps of Engineers* [Washington: GPO, 1979], p. 37; Roald Tweet, *A History of the Rock Island District, U.S. Army Corps of Engineers* [Rock Island, Ill.: U.S. Army Engineer District, Rock Island, 1984], p. 7).

†† Congress appropriated the funds with the understanding that the goal of upper river work would be a four-foot navigation channel between St. Louis and St. Paul, a project authorized in June 1878 (Tweet, p. 67; 20 Stat. 152).

completed by 1886, but work at the rapids continued until a new navigation scheme for the upper river, approved in 1907, forced revision of the whole plan.<sup>61</sup>

Neither project had great commercial value in the post-war era. The rafting of lumber downstream from northern Wisconsin and Minnesota, the most important river commerce of the late 1800s, could benefit little from the canal around the Des Moines Rapids: The canal's lock chambers were about 80 feet wide and 300 feet long and, as a consequence, were not well-suited for assisting steamboats that were towing lumber rafts 200 feet wide and 1,500 feet long.<sup>62</sup> Nor was the river's wheat trade likely to return with completion of the projects at the Rock Island and Des Moines rapids. The spread of railroads to the river's banks during the 1850s restricted river shipments of wheat to a stretch between St. Paul and railheads at La Crosse, Prairie du Chien and Dunleith, communities that were far upstream from the Rock Island and Des Moines rapids.<sup>63</sup> And even that limited wheat traffic on the river disappeared during the late 1860s and the 1870s, when railroads bridged the river and spread west, directly connecting the wheat fields of Minnesota, Iowa and the Dakotas with eastern markets and the Minneapolis flour mills.

By the end of the Civil War, rail lines were either in place or under construction throughout much of eastern Minnesota. In 1862, Minnesota's first railroad, the St. Paul and Pacific, opened 10 miles of track between flour mills at the Falls of St. Anthony and the Mississippi River levee in St. Paul.<sup>64</sup> That year, construction also began on a railroad that would connect the Mississippi River town of Winona with the western part of Minnesota and the Dakota Territory. The Winona and St. Peter line followed a route roughly parallel to the Iowa border and, by 1870, reached 139 miles west from Winona to Mankato and St. Peter.<sup>65</sup>

In 1865, another railroad began to cross the state from La Crescent, a town situated just across the Mississippi River from La Crosse. This railroad—the Southern Minnesota—followed a route south of the Winona and St. Peter line and north of the

Iowa border, and it reached Winnebago City, 167 miles to the west, in 1870.<sup>66</sup>

Another rail line that was important to Midwest agriculture reached west from McGregor, an Iowa community across the Upper Mississippi River from Prairie du Chien. Construction of the McGregor and Western line began in 1863 at McGregor and proceeded west and north toward the Minnesota border town of Le Roy.<sup>67</sup> This Iowa line eventually connected St. Paul with the east by way of a Minnesota railroad—the Minnesota Central—which extended almost due south from the Twin Cities.

Two railroads based in Milwaukee were behind both the Minnesota Central and the McGregor and Western, and all four merged in 1867 under the banner of the Milwaukee and St. Paul railroad. That November, the railroad combination closed a 60-mile gap in southern Minnesota between the tracks of the Minnesota Central and the McGregor and Western lines to establish the first rail connections between the Twin Cities and the east.<sup>68</sup> For its first seven years, the railroad's Mississippi River connection was somewhat tenuous, and steamboats ferried passengers and freight between McGregor and Prairie du Chien until a 7,200-foot-long pontoon bridge opened in April 1874 to directly link the Wisconsin and Iowa tracks.<sup>69</sup>

For the wheat trade, such rail connections improved access to Milwaukee, a leading market for spring wheat and a leading grain port on Lake Michigan.<sup>70</sup> For the general commerce of St. Paul, rail links with Milwaukee improved connections to Chicago, New York and Boston. And for both Minneapolis and St. Paul, they opened the way to commerce all year long, not just during periods of open water on the Mississippi River.

### ***The Minneapolis Flour Mills***

The flour industry of Minneapolis was the center of both the wheat agriculture that spread across the upper Midwest and the railroad network that spanned that farming region. The flour industry rooted itself at the Falls of St. Anthony during the 1860s and

1870s to exploit the tremendous water power at the 16-foot precipice. Its output soared with the adoption of new technologies during the 1860s and 1870s, and by 1880 the Minneapolis mills began a half century of domination over the nation's flour industry.<sup>71</sup> The Upper Mississippi River was essential to the prosperity of the Minneapolis mills, but its value was as a source of power, not as an avenue of transportation.

Between 1856 and 1858, two brothers, Cadwallader and William Washburn, and a handful of other investors organized the Minneapolis Mill Company and built a dam into the river's west channel to funnel water into a canal along the falls' west bank. (The original canal measured 14 feet deep, 50 feet wide and 215 feet long.)<sup>72</sup> By the late 1870s, the rush of river water through this canal drove waterwheels in basements of high, narrow mills that were crowded into a three-block milling district. The largest of these mills was Cadwallader Washburn's "A" mill, an imposing limestone structure built in 1874 that rose seven and a half stories and had waterwheels 45 feet below street level. Washburn had one of the largest operations at the falls, but he faced strong competition from Charles Pillsbury, who had five mills at the falls by 1880 and was building a plant on their east bank that would equal Washburn's "A" mill.<sup>†</sup> When it was finished, the Pillsbury "A" mill stood seven stories tall and was turning out 4,000 barrels of flour a day.<sup>73††</sup>

Despite its tremendous force, the Falls of St. Anthony was not alone sufficient to drive the Minneapolis flour industry to national and international prominence. The motive forces behind this ascent were new technologies that had special applications to milling the wheat of the old Northwest. The resulting expansion of the flour industry was

accompanied by the spread of rail lines from the Twin Cities and the expansion of a comprehensive rail network over much of the Upper Mississippi River valley.

The variety of wheat grown in states of the old Northwest profoundly influenced the development of the Minneapolis mills. Hard spring wheat was best suited to the climate of Minnesota and the Dakotas, but it yielded flour that was flecked and discolored when it was milled by conventional techniques. Millstones had to be run at high speed and pressure to grind the wheat's hard kernels, and heat generated during the process discolored the flour and reduced its keeping qualities. The thin, brittle husks of the wheat berry crumbled into fine particles during milling and were not easily separated from the flour. The flecks discolored the flour and, because they absorbed water, also could cause the flour to deteriorate.<sup>74</sup>

Millers generally preferred soft winter wheat that was typically grown east of the Mississippi River. The soft kernel of the winter wheat berry was easy to mill, and its thick, tough husk was relatively easy to sift from flour because it tended to break into large flakes during grinding. However, hard spring wheat had two qualities that insured its place in the agriculture of the old Northwest and the milling industry of the Twin Cities. First, it was suited to the climate. Pioneer farmers in Illinois, Wisconsin, Iowa and southern Minnesota had tried to grow winter wheat but lost crops to winter kill.<sup>75</sup> They turned to hard spring wheat, and it became the main crop planted on the Minnesota and Dakota frontiers.<sup>76</sup> Second, hard spring wheat contained large amounts of gluten, a substance that readily absorbs water. Gluten expands to several times its dry bulk during breadmaking and

† Washburn joined with John Crosby in 1877 and formed Washburn, Crosby and Co. After Washburn's death in 1882, his heirs ran the mills as the Washburn Crosby Company, which was famous for its Gold Medal flour. Washburn Crosby Company became General Mills, Inc. in 1928 (Herman Steen, *Flour Milling in America* [Minneapolis: T.S. Denison and Co., 1963], pp. 292-3; Charles B. Kuhlmann, *The Development of the Flour Milling Industry in the United States* [Clifton, N.J.: Augustus M. Kelly, 1973], pp. 132-133).

†† A British syndicate took control of C.A. Pillsbury and Company in 1889. Pillsbury Flour Mills Co. was organized to operate the mills after the British company went into receivership in 1908. The new company became publicly-owned in 1924 after it bought the Minneapolis mills from their British operator. The company changed its name to Pillsbury Mills, Inc. in 1944 and became The Pillsbury Co. in 1958 (Kuhlmann, p. 132; Steen, pp. 284-286).

yields more bread as a result; it also makes wheat bread lighter and more digestible than bread made from other cereals.<sup>77</sup>

During the 1860s and 1870s, two major advances transformed the flour milled from hard spring wheat from a second-rate product into a prized commodity. The first advance was the development of the "middlings purifier," a device that used puffs of air to separate the mix of husk and kernel—the "middlings"—from husk flakes and flour that were produced during grinding. Middlings could then be reground to extract more gluten from the wheat berry. By milling spring wheat in a series of grindings, extracting the middlings and then regrinding them, Minneapolis millers could produce flour equal in color to flour milled from winter wheat but superior in strength because of its high gluten content.<sup>78</sup> As Minneapolis millers adopted this "new process" technology during the 1870s, they proceeded toward an even more radical development—the abandonment of millstones, a technology that had been part of the milling trade for thousands of years.

Minneapolis millers took their lead from milling techniques used in Europe. Hungarian millers faced problems similar to those of the Minneapolis millers because Hungarian wheat was hard and dry and had a brittle husk. Hungarian millers had turned to rollers to replace sandstone millstones, which tended to wear out quickly, and millers in Minneapolis and other Minnesota towns followed suit. After experimenting with rollers made from marble, porcelain, and cast iron, the Midwest millers settled on a durable type made from chilled iron.<sup>79</sup>

Rollers were better suited to the gradual reduction grinding techniques of "new process" milling, they eliminated the expense of dressing millstones, they turned out a high quality product and yielded more flour from the wheat berry, and they were better

sued for large-scale production.<sup>80</sup> By the early 1880s, every mill in Minneapolis used rollers to some extent, and two mills owned by Charles Pillsbury and Cadwallader Washburn used rollers exclusively.<sup>81</sup> As Minneapolis millers exploited the new milling technologies, they emerged as major consumers of hard spring wheat and as dominant producers in the nation's flour industry. They built larger and more efficient mills and installed more efficient machinery in older mills to satisfy domestic and foreign demand for the high quality flour milled from hard spring wheat. As the capacity of the Minneapolis mills and the demand for flour increased, so did the demand for hard spring wheat.<sup>82</sup> In response, wheat production in Minnesota and the Dakotas more than doubled within a decade, growing from 19 million bushels in 1870 to more than 37 million bushels in 1880.<sup>83</sup>

Rail lines spread across the region to bring wheat to Minneapolis and the east, and to ship Minneapolis flour to markets in the eastern United States and Europe. By 1880, at least three separate rail lines converged on Minneapolis from the south and west to directly connect the wheat fields with the flour mills. Railroads that crossed southern Minnesota also served the wheat trade. The Chicago, Milwaukee and St. Paul, for example, extended its Southern Minnesota line until its track reached to the edge of the Dakota Territory. And the Chicago and Northwestern line, which acquired the Winona and St. Peter line, extended it until it reached Lake Kampeska in the Dakota Territory.<sup>†</sup> Other major railroads connected the Twin Cities with its hinterland and with the east.

The expansion of the flour industry, wheat agriculture and railroad network also spurred the development of a Midwest grain trade that was a distinct enterprise rather than an adjunct operation of railroads or

† To the south, four lines across Iowa connected Chicago with Iowa communities on the Missouri River. These were: the Illinois Central, which crossed the Upper Mississippi River at Dubuque, Iowa; the Chicago and Northwestern, which crossed the river at Clinton, Iowa; the Chicago, Rock Island and Pacific, which crossed the river at Rock Island, Illinois; and the Chicago, Burlington and Quincy which crossed the river at Burlington, Iowa. In 1879, the Iowa Board of Railroad Commissioners said railroads carried so much state commerce that "the Mississippi River has ceased to be a factor in the transportation of the products of Iowa" ("Report of the Board of Railroad Commissioners for 1879" in *Iowa Documents: Reports of Railroad Commissioners [1878-79]*, p. 66).

mills. The first two decades after the Civil War were formative years for some grain traders just as they had been for some flour millers. Founders of two of the world's largest grain companies—Cargill, Inc. and the Peavey Company—started their operations in the post-war period and established offices in Minneapolis in the 1880s. William Cargill began his career as a grain merchant in 1865 along the northeastern Iowa tracks of the McGregor and Western Railroad. By 1868, he owned five grain warehouses along the Iowa rail line and, in 1869, he bought an elevator at Albert Lea, Minnesota, along the Southern Minnesota rail line.<sup>84</sup> During the 1870s, Cargill and his brothers, James and Samuel, expanded their holdings across Minnesota and formed the firm of Cargill Brothers, with headquarters in Minneapolis, about 1881.<sup>85</sup> In the early 1870s, Frank Peavey was selling farm implements in Sioux City, Iowa, but he started to supplement his income with grain trading in 1873. In 1874, he built a 6,000 bushel warehouse in Sioux City and the following year he began to build other warehouses along rail lines that reached into South Dakota. After 1875, when rail lines between Sioux City and St. Paul were incorporated into the Chicago, St. Paul, Minneapolis and Omaha system, Peavey began to build elevators along the new network and to buy wheat for the Minneapolis Millers' Association. Peavey opened an office in Minneapolis in 1882, moved to Minneapolis himself in 1885, and

built one of the world's largest grain terminals in the city the following year.<sup>86</sup>

The ascendancy of Cargill and Peavey and of Pillsbury and the Washburns were part and parcel of Minneapolis' evolution into the nation's largest flour producer and wheat market by the mid-1880s. The city began its domination of the flour industry in 1880, and in 1885, it surpassed New York as the nation's largest wheat market. Its wheat receipts and shipments, elevator capacity and flour production continued to rise. Receipts grew from 10 million bushels in 1880 to more than 83 million bushels in 1900. Wheat receipts that were shipped from Minneapolis also grew, rising from shipments of 133,600 bushels in 1880 to more than 10 million bushels in 1900. Elevator capacity grew from about 1 million bushels in 1879 to about 30 million bushels in 1900.<sup>87</sup> Flour production increased from 2 million barrels in 1880 to 15 million barrels in 1900.<sup>88</sup>

Even as the Minneapolis mills and grain traders asserted their position in national and international markets, they sought trade routes to the East Coast that were independent of Chicago-based railroads and the mills they served. Lake Superior provided one alternative and railroads through Wisconsin, Michigan's Upper Peninsula and Canada provided other options.<sup>†</sup>

As a source of power, the Upper Mississippi River was fundamental to the establishment of the Minneapolis flour industry, which in turn spurred agricultural development in the upper Midwest. Once agriculture and flour milling were

† The St. Paul, Minneapolis and Manitoba line (which became the Great Northern line in 1885) tied into the Lake Superior route. In the early 1880s, the railroad acquired an interest in the tracks between St. Paul and Duluth; in 1887 and 1888, the company linked the St. Paul and Duluth railroad to Superior, Wisconsin, organized the Northern Steamship Company, and completed arrangements that allowed it to bring wheat by rail to Superior, transfer it to ships bound for Buffalo, and ship coal back to the Midwest (Joseph Gilpin Pyle, *The Life of James J. Hill, Vol. 1*. [Garden City, New York: Doubleday, Page and Company, 1917], pp. 329-32, 416, 421-2; Albro Martin, *James J. Hill and the Opening of the Northwest* (New York: Oxford University Press, 1976), p. 363; Hugo Richard Meyer, *Government Regulation of Railway Rates* [New York: The MacMillan Company, 1905], p. 244). Twin Cities' millers sought yet another route to the east that would be independent of the Chicago-based railroads as well as the Great Lakes route, which was open only part of the year. In 1883, the millers—including William and Cadwallader Washburn and Charles Pillsbury—organized the Minneapolis, Sault Sainte Marie and Atlantic Railroad Company, also known as the "Soo line." The Canadian Pacific railroad supplied capital and connections at Sault Ste. Marie that completed the rail link between Minneapolis, Montreal and Boston. In 1888, its first year in service, the Soo line carried nearly a million barrels of flour east (Charles B. Kuhlmann, *The Development of the Flour-Milling Industry in the United States, with Special Reference to the Industry in Minneapolis* [Clifton, New Jersey: Augustus M. Kelly, 1973], p. 152; Mildred Lucile Hartsough, "The Development of the Twin Cities as a Metropolitan Market," [Ph.D. diss., University of Minnesota, 1924], p. 84-88).

established, though, railroads quickly spread across the region and assumed the great bulk of trade in the old Northwest. Their presence was obvious along the length of the Upper Mississippi River valley: Railroad tracks lined the river's banks, and bridges crossed the river at 13 points between Winona, Minnesota and St. Louis.<sup>89</sup> Mark Twain caught both the presence and power of the railroads in a passage written after his trip on the Upper Mississippi River in 1882. "The locomotive is in sight from the deck of the steamboat almost the whole way from St. Louis to St. Paul—eight hundred miles," Twain wrote. "These railroads have made havoc with the steamboat commerce."

The railroads' performance frequently aggravated shippers and farmers, and freight rates—especially rate discrimination between short hauls and long hauls—were a common complaint. Competition between the Chicago-based rail lines and the three northern routes—the Lake Superior route, the Great Northern-Canadian Pacific combination and the Soo Line—brought down rail rates during the late 1800s, but railroad combinations and fluctuating grain prices sometimes limited the degree of competition and the financial benefits of the different routes.<sup>90</sup> Even so, competition between these routes had a real effect on freight rates, an effect quite unlike the vague promise of the Upper Mississippi River.

### ***Rafts of Logs and Lumber***

Even though railroad tracks lined the Upper Mississippi River, one valuable commodity—the white pine of northern Wisconsin and Minnesota—still went to market by water.

After the Civil War, waves of settlers moved onto the fertile but sparsely forested Great Plains, and the subsequent construction of houses, stores, railroads and

grain elevators created a huge market for wood. Every winter, lumberjacks moved into the Wisconsin and Minnesota forests to cut timber for that market, and in the spring, they drove thousands of logs by water to booms and sawmills on Mississippi River tributaries. There, the uncut logs and sawed lumber were lashed together and sent off to sawmills and lumber yards as far south as St. Louis.<sup>†</sup>

The lumber industry preceded the agriculture of the upper Midwest and even helped provide capital for the growth of the flour industry. Some prominent millers, such as William and Cadwallader Washburn, were heavily involved in both the lumber and flour industries, and railroads that carried wheat to Minneapolis flour mills frequently hauled wood from the urban lumber mills back to rural communities. For example, the Minneapolis and St. Louis line hauled lumber south in quantities almost equal to its wheat shipments. By the end of the decade, Minneapolis lumber mills shipped huge quantities of lumber throughout Minnesota and to Iowa, Missouri, Kansas, Nebraska and the Dakota Territory.<sup>91</sup>

La Crosse, Stillwater and Winona were three of the most important lumber milling "emporia" on the Upper Mississippi River and its tributary, the St. Croix River. Other milling centers and distribution points developed further south in the Iowa towns of Dubuque, Clinton, and Muscatine, and in the Illinois town of Rock Island. In addition, Mark Twain's hometown of Hannibal, Missouri, was the Mississippi River connection for rail lines that fanned out into Kansas, Colorado, Arkansas, Texas and New Mexico. St. Louis was important, too, both as a market and a distributing point. The city itself consumed growing amounts of pine as its population swelled, and its railroads carried lumber south toward the Rio Grande and west toward Colorado.<sup>92</sup>

Many considered the northern forests to be endless. The decline of the logging and

† In the early years of the Midwest lumber industry, sawed wood was floated down the Mississippi River in rafts guided by a pilot and about ten lumberjacks who worked huge oars. Beginning in the early 1860s, towboats were used to push rafts the entire distance to market. (Agnes M. Larson, *History of the White Pine Industry in Minnesota* [New York: Arno Press, 1972], p. 86, pp. 94-95).

lumber industry in the Upper Mississippi River valley was inevitable, though, and its end came after an assault of legendary ruthlessness and waste. Sixty to seventy percent of the timber that was cut was wasted, according to an estimate by the chief of the nation's forestry service.<sup>93</sup> Trees were cut high at the stump and sawyers discarded long sections of the tops after the rest of the tree was cut into logs.<sup>94</sup> The logging slash—the debris that remained after the logs were cut and hauled away—was left on the forest floor and, as it dried, became kindling for catastrophic fires. One such fire raged along the south shore of Lake Superior in 1863 and its smoke was so thick that it darkened the skies over La Crosse and Milwaukee, hundreds of miles to the south. One of the most famous disasters was the "Peshtigo fire" of October 1871, the consequence of high winds in northeastern Wisconsin that whipped fires along both sides of Green Bay into a firestorm that ravaged more than a million acres and killed more than 1,000 people.<sup>95</sup>

Despite the grotesque waste of nineteenth century logging, pine stands in the Upper Mississippi River valley fed sawmills between Stillwater and St. Louis for decades. About two dozen lumber ports on the Upper Mississippi River prospered during the 1870s and 1880s from the lumber industry based on white pine. Their prosperity began to fade, though, as the limits to the pineries drew closer in the 1890s and as their own positions relative to both pineries and markets began to change.<sup>96</sup> As stands of white pine near the rivers were cut over, railroads assumed the carriage of remaining timber harvests. As sources of white pine became either scarce or distant, white pine prices rose, and cheaper and more abundant yellow pine from the southern Gulf states began to dominate timber markets.<sup>97</sup>

The decline of the white pine industry in the upper river valley was slow, and booms on the upper river still handled massive amounts of timber during the 1890s. In 1890, the St. Croix Boom set its all-time record with shipments of more than 3 million logs.<sup>98</sup> In 1896, the largest log raft ever sent down the Upper Mississippi River was towed

to Rock Island. This batch of timber measured 270 feet wide and 1,550 feet long and contained more than 2 million feet of logs. Five years later, the largest lumber raft ever sent downstream was towed from Stillwater to St. Louis. Nine million feet of lumber were lashed together to form this raft, which measured 278 feet wide and 1,450 feet long.<sup>99</sup>

Rafting on the Upper Mississippi River and lumber milling along its banks diminished toward the end of the 1890s and slowly vanished during the first decades of the 1900s. No logs came down the Black River after 1897 or down the Chippewa River after 1905. The last mill at Muscatine shut down in 1905 and Winona's saws went still in 1909. Log rafting on the Upper Mississippi River came to a close shortly after the St. Croix boom closed in 1914. In August 1915, crowds lined the banks of the St. Croix and Upper Mississippi rivers to watch the towboat *Ottumwa Belle* head downstream toward Fort Madison, Iowa, with a lumber raft measuring 128 feet wide and 1,150 feet long. For five decades, residents of communities along these shores had seen the great lumber rafts floating downriver, but they would never see them again. The pineries were exhausted and, with the exception of a few barges hauling sand and gravel, so was commerce on the river.<sup>100</sup>

The disappearance of the rafts of logs and lumber from the Upper Mississippi River exposed the absence of other river traffic. It also exposed the economic vulnerability of towns that relied on the river and white pine for their prosperity. Even as the lack of river commerce became more obvious, commercial groups in river towns sought economic cures in the river's potential for navigation and hydropower. Their schemes were buttressed by a social and political movement that was shaping the government's policy toward natural resources.

### ***The Conservation Movement***

Navigation on the Upper Mississippi River was only part of a larger debate between 1890 and 1920 regarding the

nation's natural endowments, especially its water and forests. Forests, which had once seemed endless, were shrinking and their limits had become apparent. Water, which had been important for access to the continent's interior, had become critical to a national strategy of settling arid western lands.

Efficient use of the nation's water, timber and land became the center of a political and scientific phenomenon known as the "conservation movement," a movement based on economic and technical priorities, not romantic yearnings for spiritual communion with nature. The conservation movement subordinated aesthetic considerations to utilitarian goals, such as increasing industrial productivity, and its leaders emphasized efficiency and the elimination of waste.<sup>101</sup> These goals could be seen as counterpoints to the terrific waste of the Midwest logging industry and similar enterprises, but the priorities of the conservation movement also were those of scientific disciplines and technical professions that had come of age.<sup>†</sup>

As the conservation movement gained preeminence within government, a resurgent interest in water transportation developed among commercial groups. This resurgence was rooted in long-held beliefs that water transportation was cheaper than rail transportation and that development of the nation's waterways would weaken a perceived railroad monopoly over transportation.<sup>102</sup> A pointed spur to this resurgence may have been increases in railroad rates that began around the turn of the century.

Until the late 1890s, railroad rates had fallen as a consequence of competition, increased efficiency and improved facilities. Railroads had cut freight rates to attract

scarce commerce during a depression that began in 1893. They also had levelled grades, widened curves and installed heavier rails, improvements that allowed the use of larger locomotives and longer trains, thereby increasing the proportion of paying load to each train's total weight. Rail rates began to rise in the late 1890s as economic recovery and better harvests restored traffic.<sup>103</sup> As they rose, some commercial groups dug up old arguments for regulation of rail rates by way of government support for commercial navigation.

During the early 1900s, groups organized to promote waterways projects around the nation. In the Midwest, the Lakes-to-Gulf Deep Waterways Association pushed for a deep canal through the Illinois and Mississippi rivers that would connect Lake Michigan with the Gulf of Mexico, and the Upper Mississippi River Improvement Association promoted a six-foot-deep channel on the upper river between St. Paul and St. Louis. Other groups promoted projects such as a canal that would connect southern Lake Michigan with Lake Erie and a canal that would connect central Lake Michigan with Lake Huron.<sup>104</sup> However, the resurgent interest in water transportation, the goals of the conservation movement, and the interests of established federal agencies did not mesh neatly.

One of the central concepts of the conservation movement involved "multiple use" of resources. For example, the bureaucrats of the federal Reclamation Service had become aware of the potential for both storing water and generating hydroelectricity as the agency began to dam rivers in the West for reservoirs and irrigation.<sup>105</sup> However, multiple use concepts held less appeal to members of the Congressional Rivers and Harbors

† The classic analysis of the conservation movement is *Conservation and the Gospel of Efficiency* by Samuel P. Hays. Hays writes: "Conservation, above all, was a scientific movement, and its role in history arises from the implications of science and technology in modern society. Conservation leaders sprang from such fields as hydrology, forestry, agrostology, geology, and anthropology. Vigorously active in professional circles in the national capital, these leaders brought the ideals and practices of their crafts into federal resource policy. Loyalty to these professional ideals, not close association with the grass-roots public, set the tone of the Theodore Roosevelt conservation movement. Its essence was rational planning to promote efficient development and use of all natural resources. . ." (Samuel P. Hays, *Conservation and the Gospel of Efficiency* [New York: Atheneum, 1974], p. 2.)



Committee, the Corps of Engineers and the associations that promoted navigation projects on inland waterways: Multiple use would require new and broader lines of organization, and such changes threatened the primacy of navigation in the use of water resources and the established jurisdiction of the Corps and the House Rivers and Harbors Committee over those resources. In addition, neither the Corps nor the rivers and harbors committee shared the enthusiasm of the waterways associations for navigation projects because they feared the associations would pressure Congress to approve unsound proposals.

### ***The Conservation Movement and the Upper Mississippi River***

The Upper Mississippi River Improvement Association, one of many waterway groups that formed during the early 1900s, successfully lobbied Congress for authorization of a deeper navigation channel on the Mississippi River between St. Louis and St. Paul. The association organized in 1901, and its declared goal was a six-foot-deep channel between St. Louis and St. Paul. (The Corps was still working on a channel four and a half feet deep, a project that had been authorized in 1878.) While a six-foot channel was the association's primary aim, railroad rates were its primary motive for promoting the project, as

evidenced by a letter the group sent Congress after its first convention in 1902.

"The Mississippi River, north of St. Louis, is a most important highway of commerce," the association letter said. "Its effect upon transportation, and the beneficial results of water competition in the rates of freight charged by the railroad lines . . . is recognized by all and is of too great magnitude to be gainsaid."<sup>106</sup>

A Corps official at the association's 1902 conference affirmed this sentiment.

"The value of a river improvement should not be measured by the number of boats that navigate it, but by the freight charges that the people along its banks have to pay," said Major Curtis McDonald Townsend, district engineer at the Rock Island office of the Corps of Engineers. "If the railroad reduces its rate so that the shipper prefers to send his commodities by rail rather than by water, it is sad for the steamboat owner, but the rest of the community are beneficiaries."<sup>107</sup>

The group claimed a larger interest in water resource issues as well. At its 1902 convention, association members passed resolutions in support of surveys for a navigation link between the upper river and Lake Superior and in support of a proposed hydroelectric facility at the Des Moines rapids at Keokuk, Iowa.<sup>108†</sup>

More than half of the founders of the Upper Mississippi River Improvement Association represented businesses in Quincy, Keokuk and Hannibal. The association gained support other river

† Two hydroelectric facilities, one in the Twin Cities and one at Keokuk, Iowa, were authorized and built on the Upper Mississippi River during the conservation movement era. The Keokuk dam, the larger of the two facilities, was built at the confluence of the Des Moines and Mississippi rivers, a point where bluffs constricted the river valley to a width of 6,000 feet. In 1905, Congress granted a private consortium a franchise to build the dam. Work began in 1910 and the project was completed in 1913. The dam was the largest hydroelectric facility of its time. The stretch of river between St. Louis and Burlington, Iowa, was designated the "Power Zone," a name that predicted prosperity, but few industries located in the area, and power was not as cheap as predicted. Like the expanded navigation projects promoted during the same period, the dam failed to deliver the prosperity its advocates promised to the river valley (Philip V. Scarpino, *Great River: An Environmental History of the Upper Mississippi, 1890-1950* [Columbia, Mo.: University of Missouri Press, 1985], pp. 36-60). The Twin Cities structure, located downstream from the Falls of St. Anthony and upstream from Fort Snelling, had been intended for navigation, and its use for hydroelectric power seems to have been an afterthought. Congress authorized the dam in 1899 but construction was delayed. Twin Cities commercial groups and a Corps engineer both believed the dam could be modified to generate electricity, and Congress approved a revised plan in the 1910 rivers and harbors act (36 Stat. 659). The dam, known as the High Dam, was completed in 1917 and its generating facilities were leased in 1923 to Ford Motor Company, which had built a large assembly plant in St. Paul on an adjacent bluff (Merritt, pp. 142-146; Lucile M. Kane, *The Waterfall that Built a City* [St. Paul: Minnesota Historical Society, 1966], p. 175).

communities in following years, though, and its 1906 convention in Minneapolis drew 190 delegates from towns all along the river. The mayor of Minneapolis, David P. Jones, waxed eloquent about the value of the upper river to these towns in his welcoming address.

"Think of it, the Mississippi River, the mighty spinal column of the continent," Jones said. "It is the spinal cord running down the center of the national territory. The cities of Minneapolis, St. Paul, Winona, La Crosse, Clinton, Rock Island, Dubuque, Keokuk and all the way down to St. Louis are simply ganglia of population alongside the spinal cord, assisting in its development, giving it life and sustenance."

Jones cut this anatomical reference to address a subject of more fundamental interest to the delegates.

"We talk about railroad rates," he said. "By the aid of you business men the Mississippi River can be so improved that the maximum river rate will be the rate by which railroad rates will be established for us. . . . That is the solution of the railroad rates that are affecting this part of our country."<sup>109</sup>

The Upper Mississippi River Improvement Association claimed credit for prompting Congress to authorize the six-foot channel in 1907.<sup>110</sup> However, the channel on the upper river was only one of many projects that Congress authorized in the early 1900s but failed to fund, leaving the headaches of actual appropriations to future sessions.<sup>111</sup> This lack of money, along with the interruptions of World War I, kept the six-foot project from completion. Even though commerce on the upper river fell off more by the end of the war, groups from Quincy, Dubuque and St. Paul assured Congress that they would build terminals to encourage navigation on the upper river, and Congress responded by reauthorizing the project in 1922.<sup>112</sup>

## Conclusions

The conservation movement raised questions with no easy answers regarding use of the nation's resources. The most basic of these regarded the way in which decisions

were made about natural resource policies and who would make those decisions.

Efficient administration of natural resources implied an integrated approach to natural resource policies rather than resolution of policy questions as single issues. However, such integration threatened to alter or destroy single-issue relationships that bound government bodies with their clienteles, such as the single issue that bound waterways associations and the Corps of Engineers. Efficiency also implied coordination between agencies or creation of new centralized bodies that would oversee natural resource policies. Such innovations threatened to erase established lines of political jurisdiction, prospects that did not appeal to existing agencies, such as the Corps and the House rivers and harbors committee, or to lobbying organizations, such as the waterways groups. These political realities compromised some of the conservation movement's strength.

Much of the conservation movement's unity also proved to be false because it was based not on common goals but on common opposition to certain policies or bureaucrats. Schisms developed in the absence of common goals, and these divisions worsened when William Howard Taft entered the White House in 1909 and imposed narrow limits on the federal government's role in conservation matters.

The conservation movement shriveled by World War I, and its enduring legacy may be one of questions asked rather than answers given.<sup>113</sup> The reverse might be said of the waterways associations. Instead of raising new questions that may have had no easy answers, these groups raised old and simple answers for questions that were irrelevant. These groups presented water transportation as a constraint on the power of railroads, a constraint that either was inefficient or unnecessary, given existing state and federal railroad regulations.

Railroads had serious problems with congestion that became severe in 1906 and 1907. Waterways associations portrayed such problems as an indication that railroads had reached their capacity to handle the nation's commerce and that the nation needed commercial navigation to

carry the additional load. The railroads' congestion may have been the result of other problems, though. Increased regulation by state and federal governments during the early 1900s may have reduced the appeal of railroad investments, and a subsequent lack of capital may have precluded construction of new lines and rolling stock to handle the increased traffic. Mismanagement and corruption also were blamed for the railroads' problems.<sup>114</sup>

Advocates of commercial navigation and waterways projects had argued since the

1870s that waterways restrained railroad rates and that commercial navigation warranted public support for that reason. The waterways associations of the early 1900s repeated the argument, ignoring the tremendous cost of maintaining water routes and the disinterest among commercial shippers in using them. Although the lack of commerce was readily apparent on the Upper Mississippi River, the arguments of the 1870s found new life during World War I and the decade that followed.

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# CHAPTER III

## *The Awkward Resurrection*

**T**he momentum of the conservation movement and transportation problems during World War I prompted new support, if not new life, for commerce on U.S. rivers. River commerce was more a memory than a reality by the time the United States entered the European war. However, federal programs and policies during the war established a new government barge line and set the stage for increased activity on the Upper Mississippi River in the 1920s and 1930s.

War swept Europe in the summer of 1914, and armed conflict quickly spread to the Atlantic Ocean. A German campaign of unrestricted submarine warfare disrupted shipping and claimed, among many vessels, the luxury liner *Lusitania* in May 1915 and three U.S. merchant vessels in March 1917. A month after the latter attacks, the United States declared war on Germany.

Domestic transportation problems plagued the U.S. war effort: Exports to the besieged European Allies doubled traffic on U.S. railroads between 1915 and 1917 and strained the nation's railroad capacity. As a consequence of increased domestic traffic and disruptions in Atlantic shipping, rail lines and ports were clogged in the northeastern quarter of the nation, especially around New York City and Norfolk, Virginia.<sup>1</sup> In New York, piers and rail yards along the Hudson River were jammed with unloaded cars. By early 1917, the congestion was so complete that one railroad company, unable

to clear tracks leading to piers, had to use a crane to lift cars out of a crowded yard to bring them to the waterfront for unloading.<sup>2</sup>

The congestion worsened after August 1917, when an amendment to the Interstate Commerce Act gave different levels of staff in different federal agencies the authority to issue priority orders for rail shipments.<sup>3</sup> The amendment unleashed a flood of uncoordinated shipping orders that inundated rail yards and seaports in the east. Thousands of boxcars filled with cargo sat idle in the east while boxcar shortages developed in other parts of the country.<sup>4</sup>

These growing problems with transportation prompted the federal government to take over the nation's railroads in December 1917. President Woodrow Wilson seized the railroads under a clause of the Army appropriation act of 1916 which empowered him, through the Secretary of War, "to take possession and assume control of any system or systems of transportation."<sup>5</sup> The U.S. Railroad Administration ran the nationalized operation until 1920, when it returned the rail lines to their former owners.

### *War and the Nation's Waterways*

A clause in the act that authorized the railroad seizure was the germ of both a federal barge line and a strong federal

commitment to commerce on the nation's waterways, especially the Mississippi River. The clause was included in a provision that established a Council of National Defense to coordinate industries and resources "for the national security and welfare."<sup>6</sup> The council was directed to "supervise and direct investigations and make recommendations" on subjects of national importance, including the use of waterways. To these ends, it was authorized to "organize subordinate bodies for its assistance in special investigations."

The council's mission interested the Chief of Engineers, Gen. William Murray Black, and he suggested to the Secretary of War that it study inland water transportation. With the Secretary's encouragement, the Council of National Defense established the Committee on Inland Water Transportation in June 1917, with Black as its chairman and Lt. Col. Charles Keller of the Corps of Engineers as its secretary.<sup>7</sup> †

Committee membership was voluntary, and its work was poorly defined. "We had no funds with which to operate and we had no agency through which to do such work as we intended to do," Keller told the House rivers and harbors committee in January 1918. "To the extent that we were without funds, without authority, and without any specific definition of our duties, we were, of course, limited in our usefulness."<sup>8</sup>

The committee defined its mission as "investigative and advisory" and limited its inquiry to the Mississippi River system, the New York State Barge Canal and the intracoastal route on the Atlantic seaboard. During its eight months of existence, the

committee found little in the way of surprises or encouragement regarding water transportation.

"We already knew—we knew before we started—that there was little or no navigation," Keller said. "We also knew that there was comparatively little interest on the part of the various local communities that seemingly ought to be very much interested in river navigation."<sup>9</sup>

Keller admitted that communities along the river could not provide adequate commerce for river traffic.

"The waterways—take the Mississippi River, for example, as an instance—can not exist by themselves," Keller said. "I know the Mississippi River quite accurately from the Twin Cities to the mouth, and I am very sure that there is not enough traffic that originates directly on the banks of the Mississippi River to enable any very large number of vessels to do business there."<sup>10</sup>

Keller's blunt statements illustrate a significant change in arguments for government support of waterborne commerce. In earlier times, development of water commerce had been promoted as a means to regulate rail rates. However, the problems were now framed as railroad congestion, and "unification" of the nation's railroads and waterways was proposed as a solution. On the Mississippi River, for example, Keller said commercial navigation could only exist if "the navigation system is coherently and economically tied to the remaining transportation agencies of the country itself, the railways, the highways . . ."<sup>11</sup>

† The committee was reorganized four times between 1917 and 1920. It was the Committee on Inland Water Transportation, under the Council on National Defense, from June 1917 to February 1918; the Committee on Inland Waterways, under the U.S. Railroad Administration, from February 1918 to September 1918; and the Division of Inland Waterways, under the Railroad Administration, from September 1918 to March 1920. With passage of the Transportation Act of 1920, the Division of Inland Waterways became the Inland and Coastwise Waterways Service, under the direction of the Secretary of War, on 1 March 1920 (Frank T. Hines, "Report of the Chief of Inland and Coastwise Waterways Service," in *War Department: Annual Reports, 1920, Vol. 1* [Washington: GPO, 1921], pp. 1649-1695). The waterways service became a government corporation in 1924. The committee had six civilian members. Three were representatives of the Mississippi Valley Waterways Association—Walter S. Dickey of Kansas City, Mo., James E. Smith of St. Louis, and M. J. Sanders of New Orleans. Dickey, the committee's vice chairman, was president of the Kansas City and Missouri River Navigation Co. Sanders was a representative of a New Orleans steamship line. Smith was president of the Mississippi Valley Waterways Association, a merchant, and director of a St. Louis bank. Other committee members were James Ellison of Cincinnati, a former officer of the National Rivers and Harbors Congress; Joy Morton of Chicago, board chairman of Morton Salt Co.; and George Bartol of Philadelphia, a railroad director and businessman (Council of National Defense, *First Annual Report*, [Washington: GPO, 1917], p. 4; Hines, p. 1649).



Low rail rates were even blamed for thwarting this unification. "I am convinced," Keller said, "that no really successful navigation can be established unless the present structure of rail rates is completely revised so as to take away from river communities those unjustly favorable rail rates that now exist and to distribute over the community in general, including the river communities, the burden of contributing adequately toward the support of railroads. At present the river communities do not pay their just share and traffic is handled to river points at unremunerative rates. Of course the ultimate effect of that condition is to render river transportation unprofitable and practically impossible."<sup>12</sup>

In its report to the Council of National Defense, the committee recommended that the Interstate Commerce Commission or another government body set both maximum and minimum rail rates to protect river traffic. The committee also recommended that the federal government, through the U.S. Shipping Board, build equipment for inland water commerce and lease it "under reasonable terms, with option of purchase, to responsible private parties."<sup>13</sup> The recommendations did not specifically mention the Upper Mississippi River, and much of the committee's subsequent work was directed toward commerce on the lower Mississippi River.

The Committee on Inland Water Transportation was abolished in February 1918, and its work was assumed by the Committee on Inland Waterways, part of the newly created Railroad Administration that was directing federal operation of the nation's railroads. Black chaired the new water transportation committee during its brief life and saw it purchase or commandeer equipment on the Mississippi and Warrior rivers and the New York State Barge Canal.

In March 1918, the new committee submitted recommendations for wartime use

of water transportation to the Director General of the Railroad Administration. "We must put these waterways to use immediately," the committee said, and its report recommended that the government take possession of fit vessels and "combine these vessels into a single fleet."<sup>14</sup>

Shortly afterward, the Director General authorized the committee to commandeer private equipment on the lower Mississippi River, the Warrior River and the New York State Barge Canal. The Railroad Administration also established field offices in New Orleans and New York to run the barge lines, and it made \$12 million available for new equipment.<sup>15</sup> One purchase was arranged by a member of the original water transportation committee—M.J. Sanders—with another member of the same committee—Walter Dickey. Dickey was president of a barge company that was, in his own words, "a losing proposition." Sanders negotiated the government purchase of Dickey's fleet—two towboats and nine barges—for \$458,000 and of a warehouse and facilities in East St. Louis for \$40,000.

The sale went through less than a month after the committee underwent another transformation and became the Railroad Administration's Division of Inland Waterways in September 1918.<sup>16</sup> Walker D. Hines, the Director General of Railroads, created the Division of Inland Waterways to have a more formal organization overseeing the construction and operation of equipment on the three waterways.<sup>17</sup> The new body began to sign contracts for barge construction only weeks before the European armistice of November 1918. Even after the armistice ended the wartime imperative for transportation work, the division kept building scores of barges and nine towboats, a policy Hines justified as a test of "the feasibility of water transportation."<sup>18</sup>†

The name of the federal barge line and jurisdiction over it changed yet again with

† The Division of Inland Waterways oversaw federal barge operations until March 1920, and its business during this brief period was not profitable. Its operations on the New York State Barge Canal lost \$506,000 in the 1918-1919 fiscal year. Its lower Mississippi River fleet lost \$890,000 in the first 18 months after boats from Dickey's former fleet went into service in the fall of 1918 (Federal Coordinator of Transportation, *Public Aids to Transportation: Vol. III, Public Aids to Transportation by Water* [Washington: GPO, 1939], pp. 216-217).

the Transportation Act of 1920.<sup>19</sup> The act ended federal control over the nation's railroads and returned them to their former owners. However, disposition of the barge fleet was more complicated because much of the equipment had been built by the government and had never been in private ownership or part of a private enterprise.<sup>20</sup> Congress decided to retain the barge line and provided for its operation in section 201 of the transportation act. Jurisdiction over the barge line was transferred from the Railroad Administration to the Secretary of War, where the barge line was run as the Inland and Coastwise Waterways Service.

Wartime promotion of water commerce had been awkward and tardy. Most U.S. shipbuilders were busy with other wartime orders from the federal government, so barge line officials had been forced to order boats and barges from companies that had little experience in building such vessels. The results were cost overruns and delays that stretched into months and years.<sup>21</sup> Despite these problems and the fact that water transportation did not figure significantly in the nation's wartime needs, Congress entered the post-war era with a solid endorsement of water transportation. Section 500 of the 1920 transportation act said "It is hereby declared to be the policy of Congress to promote, encourage and develop water transportation and facilities in connection with the commerce of the United States." Provisions in the act authorized the Interstate Commerce Commission to set maximum and minimum railroad rates, a move intended to thwart commercial attacks on water transportation routes by railroads that offered low rates on nearby rail lines. The act also prohibited the ICC from reducing rail rates for the purpose of meeting water competition that was "merely potential."<sup>22</sup> In the 1920s, these provisions would have significant impacts on rail rates to the Twin Cities of Minneapolis and St. Paul and regions to the west which Twin Cities merchants claimed as their commercial territory. These changes, in turn, would spur lobbying for new federal activity on the Upper Mississippi River.

## *Testing the Waters of the Upper River*

The Transportation Act of 1920 put the Railroad Administration's fleet under the jurisdiction of the War Department, which had initiated its own separate barge operation on the Upper Mississippi River during World War I. This was the ill-fated "Goltra fleet," an enterprise marked by failure and haunted by years of litigation.

Edward F. Goltra was a well-known iron manufacturer and Democratic party activist from St. Louis, Missouri. Goltra owned a blast furnace in South St. Louis, and in 1917 he proposed that the federal government support a barge fleet that would haul coal upriver to St. Paul and haul iron ore back to his St. Louis plant.<sup>23</sup> In May 1917, the War Department decided to support Goltra's plan, which was supposed to boost production of pig iron at Goltra's plant and thereby assist wartime steel manufacturing.<sup>24</sup>

The towboats Goltra used to attempt this trade were two vessels that the Corps of Engineers were testing to evaluate the prospects for Mississippi River commerce. The board of Army engineers that was conducting the tests received instructions in June 1917 to lease the vessels to Goltra for the river run.<sup>25</sup> The engineers leased the towboats *Nokomis* and *Sachem* to Goltra and, on 30 July 1917, the *Nokomis* sailed for St. Paul with six barges loaded with 2,900 tons of coal.<sup>26</sup> Two weeks later, the boat and barges reached St. Paul.

St. Paul's riverfront was not well equipped for shipping coal or iron ore. A locomotive crane had to be brought in and parked on a railroad spur to unload coal from the barges, an effort that took about a week to complete.<sup>27</sup> Makeshift chutes then had to be installed in the middle of a Mississippi River railroad bridge to dump iron ore from rail cars into the barges.<sup>28</sup> About 3,400 tons of iron ore were poured into Goltra's barges during two days in late August and, on 28 August 1917, the *Nokomis* and its cargo headed south with the first shipment of iron ore ever made on the river. Nearly two months later, the *Nokomis* finished the journey.

The *Nokomis* was built for deeper water in the lower Mississippi River, and it grounded at nearly every sand bar between St. Paul and St. Louis. Water levels had dropped steadily during the week the coal barges were unloaded in St. Paul, and the *Nokomis* was riding the river's bottom during much of its trip downstream. When the boat touched bottom, the barges frequently went out of control and ran aground.<sup>29</sup>

Smaller, lighter vessels eventually guided the ore-filled barges back to St. Louis and the *Nokomis* struggled downstream alone. Its captain, anxious to improve its performance, tried to make the boat lighter by removing everything "except the cook and the paint."<sup>30</sup> His valiant efforts were not enough to speed the trip, though: Some stretches of the river needed to be dredged before the boat could pass and low water temporarily stopped it at the Rock Island rapids. After nearly two months of delays, the *Nokomis* finally arrived in St. Louis on 20 October 1917.<sup>31</sup>

This attempt at a St. Louis-St. Paul barge operation consumed all profits plus an additional \$10,000.<sup>32</sup> Goltra tried to make another upstream coal shipment in October, but the towboat again encountered problems with the river channel, and the load was diverted up the Illinois River to Hennepin, Illinois.<sup>33</sup> Despite these failures, members of the Committee on Inland Water Transportation believed that navigation on the Upper Mississippi River had promise and they backed Goltra's request for federal support of a private barge operation there.

Other parties had presented plans for federal support of private navigation on U.S. waters. Lt. Col. Keller told the House rivers and harbors committee in January 1918. However, none of the offers were "predicated upon as tangible a basis as Mr. Goltra's," Keller said. "He (Goltra) has already satisfied himself and the rest of us are agreed with him, that such business can be carried out without difficulty."<sup>34</sup>

In its written report to the Council on National Defense, Keller and the committee did not specifically recommend federal support for a fleet on the Upper Mississippi River. However, the council took the proposal for such a fleet to the U.S. Shipping Board Emergency Fleet Corporation, which made a

special allocation of \$3,860,000 for construction of equipment to be operated between St. Louis and St. Paul.<sup>35</sup> Unlike the other wartime barge operations, the upper river fleet was built and operated under the jurisdiction of the Secretary of War, specifically the Chief of Engineers.

In August 1918, Corps officials signed contracts for construction of 19 barges for Goltra's operation.<sup>36</sup> Contracts for towboat construction and Goltra's operation of the fleet were not even signed at the time of the November armistice that ended the European war, but work on the upper river fleet continued. The War Department signed a five-year contract with Goltra in May 1919 for operation of the barges on the Upper Mississippi River.<sup>37</sup> In June 1919, the department signed a contract for construction of four towboats for Goltra's fleet. In October 1921, the department signed a contract for construction of machinery adjacent to Goltra's land in St. Louis that would be used to transfer ore from the river to Goltra's blast furnaces.<sup>38</sup>

Goltra took possession of the barge and towboat fleet in July 1922 and used the equipment twice during the year.<sup>39</sup> Neither voyage took coal to St. Paul or brought iron ore back to St. Louis. The towboat *Illinois* and several barges made a trip between St. Louis and Caseyville, Kentucky, during August and September 1922, and the *Illinois* also made an unsuccessful attempt to haul a load of cement from Hannibal, Missouri, up the Ohio River to Cincinnati, Ohio.<sup>40</sup> The fleet went into winter storage late that fall and stayed there.

The Secretary of War, John W. Weeks, terminated the department's contract with Goltra in early March 1923, claiming that Goltra had broken the contract by failing to provide general transportation to the public. Goltra requested a hearing and protested the cancellation of his lease.<sup>41</sup> The War Department responded by sending Col. Thomas Quinn Ashburn, a career officer and the chief of the Inland and Coastwise Waterways Service, to St. Louis to repossess Goltra's fleet, an order Ashburn fulfilled on the morning of Sunday, 25 March 1923. With a contingent of about 40 men, Ashburn seized all four towboats and most of the 19

barges that Goltra had leased. The U.S. towboat *Vicksburg* then took the vessels across the Mississippi River to the Illinois shore, removing them from the jurisdiction of local, state and federal authorities in Missouri.<sup>42</sup>

Ashburn's seizure of the Goltra fleet was a precise military operation but a sloppy legal exercise. The action gave rise to court fights that continued until September 1924, when the U.S. District Court in St. Louis issued an injunction that returned the boats to Goltra's possession. The injunction was to remain in effect until a final resolution of the case. A partial resolution took almost two years; the final settlement took the better part of two decades.

### ***The Status of the Twin Cities***

Goltra's barge fleet, doomed as it was, never held much promise for trade between St. Paul and St. Louis in iron ore and coal, nor could it offer much to the basic economy of the Twin Cities. By the time the *Nokomis* made its tortured trip to and from St. Paul, the Twin Cities had been thoroughly integrated into networks of transportation and commerce that spanned the nation. A metropolitan economy tied into the farming, finance, industry and wholesale trade of North America was too big to be influenced by cargo in the holds of a few barges.

The economic base of both Minneapolis and St. Paul had diversified in the four decades since mills at the Falls of St. Anthony began their domination of the nation's flour trade. St. Paul's economy, for example, was now dominated by its meat-packing industry and livestock market, which ranked fifth in the nation by 1916 and drew cattle, sheep and hogs from Minnesota, the Dakotas and Montana.<sup>43</sup> Minneapolis was home to prosperous metal industries that manufactured and sold foundry and machine shop products, structural steel, railroad and mill machinery, and farm implements. By 1920, Minneapolis also had a 200-acre industrial district on its northeast side and St. Paul had its "Midway" district. Both industrial tracts had extensive rail

connections, and the Midway also contained the sprawling railroad switching yards of the Minnesota Transfer, an organization formed by railroads that served the Twin Cities.<sup>44</sup>

The Twin Cities were principal distributing centers for wholesalers who claimed Minnesota, the Dakotas and Montana as their commercial territory. (St. Paul was the original distributing center, but Minneapolis' wholesale commerce surpassed it in 1890.) By 1920, the Minneapolis Civic and Commerce Association claimed its community was "a billion-dollar city" in terms of wholesale trade and sale of local manufactures. Wholesalers in the Twin Cities handled a wide range of commercial items that included groceries, produce, dry goods, drugs and clothing. Farm implements also were important to the Minneapolis wholesale trade in 1920: Major manufacturers such as International Harvester Company, Deere and Company, J.I. Case Threshing Machine Company and J.I. Case Plow Works Company all had representatives there.<sup>45</sup>

The flour industry and the grain trade still loomed large in Minneapolis' economy. Minneapolis was the single most important grain market for Minnesota, all of North Dakota, most of South Dakota, and much of Montana.<sup>46</sup> The Twin Cities' elevator capacity was the nation's largest at 55 million bushels, followed by Chicago with 49 million bushels and Duluth-Superior at 36 million bushels.<sup>47</sup>

The elevators, most of them erected since the turn of the century, were concentrated along rail lines in Minneapolis with the notable exception of the Equity Cooperative Exchange terminal in St. Paul. This 500,000-bushel terminal, built in 1916, belonged to the American Society of Equity, a farmers' organization that tried to force better prices for farm produce by marketing it through its own agencies and elevators. The society formed the Equity Cooperative Exchange in Minneapolis in 1908 to handle grain sales and raise money for a terminal elevator. The exchange moved to St. Paul after it was denied a seat on the Minneapolis Chamber of Commerce and became entangled in a local feud with banks, elevators and railroads. In 1914, a St. Paul commercial club offered the exchange

\$30,000 and a free elevator site in downtown St. Paul on the banks of the Mississippi River. The site, of course, had rail access.<sup>48</sup>

In 1920, three flour companies—the Northwestern Consolidated Milling Company, Pillsbury Flour Mills Company and the Washburn-Crosby Company—operated more than ten mills in Minneapolis' milling district at the Falls of St. Anthony. (The mills were separated from the river by the tail race of the milling canal and by railroad lines.) Production at the Minneapolis mills had peaked during the preceding decade; annual production between 1910 and 1920 averaged 16 million barrels and peaked at 20 million barrels in 1915-16.<sup>49</sup> During the 1920s, though, the Minneapolis mills lost their hold on the nation's flour trade to mills in other cities such as Kansas City and Buffalo. Buffalo was especially important: It became a major flour center between 1900 and 1920, and its mills served foreign markets as well as urban markets in the northeastern states.

New mills in these and other flour centers had advantages over the old Minneapolis mills in terms of techniques and facilities. These advantages were complemented by decisions of the Interstate Commerce Commission that either favored Buffalo or eliminated rail rate advantages for Minneapolis. The climax to these decisions came in 1920, when the ICC virtually wiped out "milling-in-transit" rate privileges for Minneapolis millers and effectively isolated the mills at the Falls of St. Anthony as regional producers.<sup>50</sup>† After the 1920 ruling, Minneapolis millers opened or expanded operations in Buffalo, Chicago and Kansas,

and the dominance of Minneapolis in the flour industry began to slowly fade.<sup>51</sup>

### *Freight Rates and the River*

The 1920 ICC decision on milling in transit applied only to grain and made no mention of the Upper Mississippi River as a factor in the trade. Transportation on the upper river figured much more strongly in a 1922 ICC decision that covered a wide range of freight categories. The findings in this and other rate cases described the upper river's insignificance to business in the Twin Cities, and their most immediate effect was an increase in railroad freight rates. With time, though, these decisions would prompt the reshaping of the Upper Mississippi River.

The 1922 ICC decision in the so-called "Indiana rate case" involved a complaint by the Public Service Commission of Indiana that rail rates from points in Indiana to St. Paul and Minneapolis were unreasonable.<sup>52</sup> The complainants argued that many Indiana merchants were shut out of Twin Cities commercial markets by rates to the cities that were unreasonably higher from Indiana than they were from Chicago, St. Louis, points in Illinois, and points on the west bank of the Mississippi River in Iowa and Missouri. The complaint referred to rates on a wide variety of freight, including agricultural implements, steel and furniture.

In its decision, the ICC noted that competition from water carriers on the

† As the Minneapolis flour industry grew after the Civil War, its demands affected farming regions that supplied wheat to flour mills in Milwaukee and the former wheat ports on the Mississippi River. Millers in Milwaukee and in river towns such as Hastings, Red Wing, Winona and La Crosse, as well as the railroads that served these communities, lost their hold on western wheat supplies to grain buyers in the Minneapolis market who often paid higher prices. To protect millers in Milwaukee and along the Mississippi River, railroads that served them offered a rate privilege called "milling in transit." The arrangement allowed millers to bring grain from fields to the mills, unload and grind it, and then send flour milled from the shipment at a rate that applied from the point of origin of the grain to the point of consumption of the flour. The advantage of milling in transit lay in the through rates—they were lower than the local rates that would apply first to shipments between the wheat fields and the mills, and then from the mills to the flour markets. Milling in transit did not end competition among millers in the different markets, because railroads serving Minneapolis mills subsequently offered the same privileges to their customers. Competition for grain eventually slackened, though, as wheat fields expanded to the north and west of Minneapolis and provided sufficient amounts of wheat to the different Midwest markets (Logan G. McPherson, *Railroad Freight Rates in Relation to the Industry and Commerce of the United States* [New York: Henry Holt and Co., 1909], pp. 195-200; William Zebina Ripley, *Railroads: Rates and Regulations* [New York: Arno Press, 1973], p. 402).

Mississippi River had once influenced rates between St. Louis and St. Paul. In 1909, this competition had been significant enough for the ICC to justify rates between St. Louis and St. Paul that were lower than rates from Indianapolis to St. Paul.

"Since then circumstances have changed," the commissioners wrote in their 1922 decision. "Water competition on the Mississippi River north of St. Louis is no longer recognized as a controlling force but is little more than potential." The commission agreed with the Indiana complainants that circumstances did not warrant substantial differences between rates from St. Paul to Indiana and rates from St. Paul to either St. Louis or Chicago. On 14 February 1922, the commission ruled that carriers would have to readjust rates to eliminate prejudicial differences between the separate regions.

The ICC decision did little to revive commercial navigation on the Upper Mississippi River. A group of Twin Cities businessmen formed a barge company, the River Transit Company, seven months after the ICC decision, but its operations during four years of existence were sporadic and relatively insignificant.<sup>†</sup> However, subsequent ICC decisions would have much more serious consequences for river transportation and the river itself.

The 1922 ICC case was the first of several rate cases that affected Twin Cities' commercial interests. In 1924, a reprise of the Indiana rate case and a complaint by a fruit preserve company in Louisville, Kentucky, prompted the commerce commission to reassert the irrelevance of the

Upper Mississippi River to railroad rates. These cases were followed by a spate of other complaints that involved both freight rates to the Twin Cities and the hold Twin Cities wholesalers had on a vast region to the west.

The Public Service Commission of Indiana, one of the complainants in the original rate case, resubmitted its grievances to the ICC in 1923. On 8 April 1924, the ICC once again ruled that rates to the Twin Cities from Indiana were "unreasonable and unduly prejudicial" and that competition from water carriers "is no longer of importance in determining the rates." Agricultural implements and several categories of iron were among the freight items that were shipped under higher rates from Indiana than from points in Illinois. The ICC advised carriers to readjust rates to eliminate discrimination in rates.<sup>53††</sup>

The same day, the ICC ruled on two other cases that either affected rates to the Twin Cities or rates to territory that Twin Cities merchants claimed. In another case that involved the Indiana public service commission, the ICC ruled that rates from Indiana to several cities west of the Mississippi River—including Sioux City, Iowa, and Sioux Falls, South Dakota—were unreasonable and should be changed.<sup>54</sup> The ICC made a similar decision in a complaint filed by a company in Louisville, Kentucky, that claimed rates from Louisville to St. Paul and Duluth were unjustly higher than rates from St. Louis to St. Paul.<sup>55</sup>

In June and July 1925, the ICC ruled on more complaints brought by commercial groups in Fargo, North Dakota, and

† The company was incorporated 11 October 1922 in Ramsey County, Minnesota. Its board of directors included James Brodie, president, of St. Paul; Charles Stetson, vice president, of St. Paul; Frank Lampson of Minneapolis; Willoughby Babcock of Minneapolis, and Engebret Hobe, of St. Paul. Stetson was president of Fidelity Storage Transfer Co.; Lampson was president of Minneapolis Transfer and Warehouse Co.; Babcock was a lawyer with Gilger and Babcock; and Hobe was consul for Norway.

The company's operations appear to have been minor. Hobe made an awkward remark about its business during a May 1924 speech on river commerce when he said, "I have omitted statistics entirely because we have so little of it for the Upper River" (Address by Hobe to Upper Mississippi Improvement Conference, May 1924, E.H. Hobe papers, Minnesota Historical Society, St. Paul).

†† A paragraph in the ICC decision attempted to explain the Upper Mississippi River's earlier influence on rail rates. "The rates from St. Louis to St. Paul were originally influenced by water competition on the Mississippi River and by the effort of the carriers leading from St. Louis to St. Paul to make rates which would enable that city to meet at St. Paul the competition of Chicago. Lines operating through the State of Illinois and via Chicago maintained the same rates from St. Louis and applied no higher rates at intermediate points. Thus the low basis of rates applying from St. Louis was extended throughout a large portion of the State" (88 ICC 711).

Watertown, South Dakota. The commission decided ten complaints regarding rates to and from Fargo and found in all that rates were either unreasonable to Fargo or unduly preferential to other points. (Among the issues in these complaints were the hold Twin Cities merchants had over territory west of Fargo in North Dakota, Montana and Canada.)<sup>56</sup> The commission made similar decisions on four complaints regarding rates to and from Watertown.<sup>57</sup> In all cases, the ICC either advised or ordered carriers to adjust rail rates to remove the discrimination.

These decisions by the ICC unnerved Twin Cities merchants. Orders to remove discriminatory rates threatened to increase freight rates from the east to St. Paul and Minneapolis or to disrupt commercial relationships between the Twin Cities and vast regions to the west. Such a disruption

could disadvantage wholesalers in the Twin Cities because they would face new competition from other wholesalers, especially those in Chicago.<sup>58</sup>

With each new ICC decision, business interests in the Twin Cities became more aware that commerce on the Upper Mississippi River once had a strong bearing on railroad rates and that it might exert that influence again. In late 1924 and early 1925, local politicians and business agents looked for ways to return commerce to the upper river. They started by pressuring the federal government to extend its barge service to the Twin Cities. After this effort succeeded, they lobbied for the largest public works program ever undertaken on the ancient river channel between Minneapolis and St. Louis. Their efforts yielded a series of locks and dams that shackled the river in the name of commerce that barely existed.

## Chapter III Notes

1. Congressional Record, Vol. 56, p. 2016 (hereafter cited as Cong. Rec.).
2. *New York Times*, 11 February 1917.
3. 40 Stat. 272.
4. John F. Stover, *American Railroads* (Chicago: University of Chicago Press, 1961), pp. 184-185; Cong. Rec., Vol. 56, pp. 2016-2017.
5. 39 Stat. 645.
6. 39 Stat. 649.
7. U.S. Congress, House, Committee on Rivers and Harbors, *Hearings on the Subject of Inland Water Transportation*, 65th Cong., 2d sess., 25 January 1918, pp. 3-4; U.S. Congress, Senate, Select Committee to Investigate the Executive Agencies of the Government, *Investigations of the Executive Agencies of Government*, 75th Cong., 1st sess., 1937, S. Rep. 1275, pp. 496-497.
8. *Hearings on inland water transportation* (25 January 1918), p. 5.
9. *Hearings on inland water transportation* (25 January 1918), p. 6.
10. *Hearings on inland water transportation* (25 January 1918), p. 8.
11. *Hearings on inland water transportation* (25 January 1918), p. 9.
12. *Hearings on inland water transportation* (25 January 1918), pp. 7-8.
13. *Hearings on inland water transportation* (25 January 1918), p. 34.
14. Frank T. Hines, "Report of the Chief of Inland and Coastwise Waterways Service," in *War Department: Annual Reports, 1920, Vol. 1* (Washington: GPO, 1921), pp. 1652-1653.
15. Hines, pp. 1662-1663.
16. G.A. Tomlinson, "Annual Report, Division of Inland Waterways, for 1919", in *Annual Report of Walker D. Hines, Director General of Railroads, 1919* (Washington: GPO, 1920), p. 10, 28; U.S. Congress, House, Committee on Rivers and Harbors, *Hearings on the Subject of Inland Water Transportation*, 65th Cong., 3d sess., 13 December 1918, pp. 18-19.
17. Hines, p. 1663.
18. U.S. Congress, House, Subcommittee of House Committee on Appropriations, *Hearings on Appropriation for Federal Control of Transportation Systems*, 65th Cong., 3d sess., 10 February 1919, p. 124.
19. 41 Stat. 456.
20. Hines, pp. 1693-1694.
21. Hines, p. 1692.
22. Federal Coordinator of Transportation, *Public Aids to Transportation: Vol. III, Public Aids to Transportation by Water* (Washington: GPO, 1939), p. 19.
23. *Hearings on Inland Water Transportation* (25 January 1918), p. 36.
24. *Report of the Chief of Engineers, U.S. Army: 1922* (Washington: GPO, 1922), p. 2103 (hereafter cited as COE with year given in parentheses).
25. COE (1917), p. 1826; 36 Stat. 659 and 39 Stat. 403.
26. COE (1918), p. 1875.
27. *St. Paul Pioneer Press*, 22 August 1917.
28. COE (1922), p. 2104; *St. Paul Pioneer Press*, 28 August 1917.
29. COE (1922) p. 2104.
30. *Hearings on inland water transportation* (25 January 1918), p. 38.
31. COE (1918), p. 1875.
32. *Hearings on inland water transportation* (25 January 1918), p. 38.
33. COE (1918), p. 1876.
34. *Hearings on inland water transportation* (25 January 1918), pp. 20-21.
35. *Hearings on inland water transportation* (25 January 1918), p. 21; Hines, pp. 1650-1651.
36. COE (1922), p. 2108.
37. 263 United States Reports 389; 7 Federal Reporter (2d Series) 838.
38. COE (1922), pp. 2114-2115.
39. COE (1922), p. 2110.
40. 91 Court of Claims 42.



41. *St. Louis Globe Democrat*, 26 March 1923.
42. 7 Federal Reporter (2d) 838; 91 Court of Claims 70; 271 United States Reports 536.
43. Mildred Lucile Hartsough, "The Development of the Twin Cities (Minneapolis and St. Paul) as a Metropolitan Market" (Ph.D. diss., University of Minnesota, 1924), pp. 67-68.
44. Hartsough, pp. 70-1.
45. Hartsough, pp. 51-56.
46. Hartsough, pp. 178.
47. Hartsough, pp. 184.
48. Fossum, pp. 80-87. The Equity terminal, located along the Mississippi River between Sherman and Chestnut streets, consisted of 18 grain tanks built of reinforced concrete with rail access on the inland side.
49. Charles B. Kuhlmann, *The Development of the Flour-Milling Industry in the United States, with Special Reference to the Industry in Minneapolis* (Clifton, New Jersey: Augustus M. Kelly, 1973), p. 172.
50. 56 ICC 689.
51. Kuhlmann, p. 172-7; Joseph Charles Fitzharris, "A Model of Urban Growth and Transition: The Twin Cities, 1870-1930," (Ph.D. diss., University of Wisconsin-Madison, 1975), p. 114.
52. 66 ICC 512.
53. 88 ICC 709.
54. 88 ICC 728.
55. 88 ICC 725.
56. 98 ICC 691, 695.
57. 101 ICC 427 and 101 ICC 441.
58. 88 ICC 735.

# CHAPTER IV

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## *Rolling the Father of Waters*

A century of human activity altered and fouled much of the the Upper Mississippi River between Minneapolis and St. Louis. By the 1920s, sewage and refuse contaminated much of the river, and structures designed to aid navigation—wing dams that funneled water toward the central navigation channel—destroyed its fertile wetlands by trapping sediment in backwater sloughs and marshes.

Navigation aids on the river were labelled "improvements," a term that was marginally appropriate to their commercial value. However, the decisions of the Interstate Commerce Commission in rate cases during the early 1920s spurred lobbying for more of these projects on the Upper Mississippi River, and a strong constituency formed to back these demands. Commercial interests from towns throughout the upper river valley gave it financial and political substance, but its priorities were established by a select group of business agents from the Twin Cities. Their first project was the extension of federal barge service from St. Louis to the Twin Cities, and their quick success in this effort gave momentum to new schemes. The Twin Cities lobbyists put their political skill and financial resources into a vague plan to replace the six-foot channel project with a deeper, nine-foot channel in the hopes of luring commerce back to the river, thereby strengthening their leverage with the railroad managers and ICC bureaucrats who

determined rail freight rates. The persistence of these lobbyists, along with the political realities of the Great Depression, eventually yielded an immense public works project, the construction of two dozen locks and dams between the Twin Cities and the Missouri River.

### *Waterways Debates*

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The lobbying for projects on the Upper Mississippi River had a relatively small part in the debate over rivers and harbors legislation during the 1920s. International commissions, Congress, and federal and state agencies all were grappling with water resource issues that had sweeping implications for both the United States and Canada. Foremost among them were proposals to improve the shipping connections between the Atlantic Ocean and the Great Lakes.

The St. Lawrence River and the old Erie Canal were the most important routes under consideration, but prospects for either waterway were complicated by a proposal for the Illinois River. Waterways advocates and Illinois legislators supported a plan to develop a nine-foot-deep channel from Chicago to the Gulf of Mexico via the Illinois River. This project, in turn, involved Chicago's "sanitary canal" and the diversion of water from Lake Michigan to flush

Chicago's sewage down the Illinois River. Congressional representatives and officials from the Great Lakes states blamed the diversion for lowering water levels on the lakes and threatening the future of transportation on them. They were wary that the Illinois River navigation project would require greater diversions and worsen the alleged drop in lake levels.

By the middle of the decade, the Atlantic Ocean seaway and the Illinois River channel were two of the most disputed navigation projects before Congress. Far less controversial was the proposed reorganization of the federal barge operation on the lower Mississippi and Warrior rivers.

The Transportation Act of 1920 had maintained the fleet as part of a government effort "to promote, encourage, and develop water transportation." Between 1920 and 1924, the War Department operated the barges on the Mississippi and Warrior rivers as the Inland and Coastwise Waterways Service and funded it with annual appropriations from Congress. A U.S. representative from Illinois, Edward E. Denison, introduced legislation in February 1924 to reorganize the barge line and "put it on a practical business basis." Denison's bill came before the House Committee on Interstate and Foreign Commerce in February and March 1924, and Thomas Q. Ashburn, the chief of the barge operation, testified in support of the plan.

The barge line would demonstrate within five years that water transportation was "feasible and economical" if it could operate as a private transportation agency, Ashburn said.<sup>1</sup> However, Ashburn said both the barge line and the restoration of waterborne commerce needed navigable waterways, suitable equipment and terminals, balanced loads of freight, facilities for cargo transfers with railroads, and joint rates for traffic that traveled by rail and water.<sup>2</sup> The House commerce committee agreed.

"It is the view of the majority of this committee that the Government should leave to private capital the responsibility of furnishing transportation facilities under proper regulations of the Government," the committee reported in March 1924. "But it is also the view of the committee that the

Government should itself encourage private capital to invest in transportation facilities by removing every obstruction, natural or artificial, which will make it impossible for private capital to invest in such facilities with a reasonable chance for profit."<sup>3</sup>

Denison's plan would create a new government corporation to run the federal barge line under jurisdiction of the Secretary of War. His bill would increase the barge line's capital stock to \$5 million and establish an advisory board as the corporation's board of directors. Denison's bill also would free the corporation of bureaucratic regulations that thwarted common business practices. For example, the corporation would be able to borrow money in emergencies. Congress approved Denison's plan, and the Inland Waterways Corporation was created in June 1924.<sup>4</sup>

### *The Lobbyists Incorporate*

Neither the Inland Waterways Corporation nor prospects for its operation on the Upper Mississippi River had excited merchants and shippers in the Twin Cities. Hearings on the proposal drew only thirteen witnesses, none of whom represented associations or businesses in Minneapolis and St. Paul. However, the string of ICC decisions that started with the Indiana rate case and continued into 1925 was alerting merchants and shippers in the Upper Mississippi River valley to the river's role—or potential role—in setting freight rates.

In 1924, the federal government's main navigation project on the Upper Mississippi River was the attempt to maintain a six-foot-deep channel between St. Louis and Minneapolis, a project authorized in 1907. The Corps of Engineers had finished only half the project because Congress failed to appropriate enough money for its completion and World War I had interrupted the work that was underway. Congress reauthorized the project in 1922, and the House rivers and harbors committee conducted hearings in March and April 1924 to evaluate its progress.<sup>5</sup> The Upper Mississippi River's role in Midwest freight rates—and the growing

awareness that Twin Cities business officials had of it—was evident in the testimony of a witness from St. Paul.

"The rail rates from Chicago and the entire eastern territory to the Twin Cities are materially lower than would be the case if we were not located at the head of navigation on the Mississippi River and but 150 miles from the head of Lake Superior," said Herman Mueller, traffic director of the St. Paul Association of Public and Business Affairs. "These depressed rail rates are reflected in all of the rates throughout the states of Illinois, Wisconsin, Iowa, Minnesota and the Dakotas. The permanence of this rate structure is absolutely dependent on actual, not potential water competition."<sup>6</sup> Less than three weeks after Mueller's testimony, the ICC ruled in the revised Indiana rate case that water competition on the Upper Mississippi River was "at most potential."

That fall, a committee of the Minneapolis Real Estate Board began to investigate the nature of this "potential." The Minneapolis Real Estate Board was a forum from which commercial interests in the Twin Cities and Upper Mississippi River valley often addressed economic issues during the 1920s. Between 1924 and 1926, it was vital in ordering the federal government's agenda for work on the Upper Mississippi River, especially as it concerned the extension of federal barge service above St. Louis.

After examining business conditions in the Twin Cities and their trade territory, the Real Estate Board's special committee concluded that "disadvantageous rates were pertinent factors" in the region's business situation and that restored navigation on the upper river would be in "the best commercial interests of Minneapolis."<sup>7</sup> By late August 1925, the board's investigations of barge service to Minneapolis and St. Paul coalesced into active lobbying for barge service on the Upper Mississippi River.

The Real Estate Board authorized Samuel Thorpe, a prominent board member, to

appoint a committee that would negotiate with the federal government for barge service to Minneapolis.<sup>8†</sup> Thorpe, 61, chaired the committee and selected its members from businesses in Minneapolis, St. Paul, and river towns in Minnesota, Wisconsin, Iowa and Illinois. Twin Cities members included Willard W. Morse, 61, president and founder of Minneapolis' first commercial warehouse; Richmond P. Warner, 54, vice president of a wholesale grocery business in St. Paul; Edgar J. Ellertson, purchasing agent for a Minneapolis manufacturer of road building machinery; and William Hamm, 66, the son of brewer Theodore Hamm and the president of a St. Paul real estate company.<sup>9</sup>

Shortly after the committee formed, four of its members met with other Minneapolis businessmen and a U.S. Representative from Minnesota, Walter H. Newton, to discuss IWC operations on the Upper Mississippi River. They decided on a plan whereby local or regional groups would raise money and oversee construction of a barge fleet for IWC service to the Twin Cities. The plan met with general approval in Washington.

Ashburn, the federal barge line administrator, told the Twin Cities group that Dwight F. Davis, the acting Secretary of War, would approve the plans with some conditions: that the Twin Cities committee form a corporation to build boats and barges; that the committee raise the money needed to build the equipment; that it build at least one "unit" consisting of a towboat and three or more barges; and that it initially operate the fleet. The IWC would take over the barge fleet's operation within a year of settling litigation involving the Goltra fleet.<sup>10</sup>

Thorpe and Morse, along with several other businessmen, followed Ashburn's first suggestion and formed a corporation, the Upper Mississippi Barge Line Company, in November 1925. The company's first officers were Thorpe as president, Morse as vice president, and Arne Wiprud, a Minneapolis attorney, as secretary and treasurer. Its

† Thorpe acquired a small fortune during the 1880s selling lots on Minneapolis' south side. He later headed Thorpe Brothers, Inc., and was active in developing Minneapolis landmarks such as the Dyckman Hotel. In the 1920s, he was involved in developing the "Country Club" district of the Minneapolis suburb of Edina (St. Paul Pioneer Press, 6 October 1936).

directors were Richmond Warner, Charles Webber and Burton Peek. Webber and Peek both were executives of Deere and Company, a major manufacturer of farm machinery that had headquarters in Moline, Illinois. (Webber, 66, was a grandson of John Deere, a director and vice president of Deere and Company and president of Deere and Webber Company, the Minneapolis outlet for Deere farm machinery. Peek, 53, was a vice president and director of Deere and Company in Moline.<sup>11)</sup>

The nature and purpose of the Upper Mississippi Barge Line Company covered eight pages of its incorporation papers and were described in terms as broad and vague as language allows. For example, the new company's transportation functions were described as: "To transport and carry anybody or anything anywhere by vessels of any kind or by any other mode of transportation." Despite this clause, the heads of the new barge line were not keen on Ashburn's suggestion that they actually operate a barge line on the Upper Mississippi River. They suggested that the IWC should lease and operate any equipment that the company might build with the provision that the IWC eventually would purchase the equipment.<sup>12</sup> The Twin Cities businessmen were prepared to raise money and build boats and barges, but they held that the government was legally bound to operate them on the upper river under provisions of the Inland Waterways Corporation Act.<sup>13†</sup>

Wiprud, the barge line's legal counsel, traveled to Washington in early December with Morse and George C. Lambert, a St.

Paul man who also was lobbying for river commerce, and the entourage personally brought this argument to Ashburn and others in the Coolidge administration. The Twin Cities group lobbied hard in Washington and carried their plan to Secretary of War Davis, Secretary of Commerce Herbert Hoover, and President Calvin Coolidge. They pleaded for barge service to mitigate the effects of the recent ICC decisions, especially increases in freight rates and the erosion of wholesale trade advantages over regions to the west. However, the Twin Cities lobbyists maintained as their central argument the claim that the IWC was bound by its enabling legislation to extend operations to the Upper Mississippi River.<sup>††</sup>

The War Department yielded to lobbying from the Twin Cities group, and Secretary of War Davis declared on 12 January 1926 that the IWC could legally extend barge service to St. Paul and carry out the proposal of the Upper Mississippi Barge Line Company.<sup>14</sup> Ashburn visited Minneapolis the following week to sign a contract with the Upper Mississippi Barge Line Company, and he used the occasion to deliver a public speech on river commerce that sometimes was quite extravagant. Standing before a crowd of about 800 people at Minneapolis' Nicollet Hotel, Ashburn likened the extension of the government barge fleet to the battle of the French army at Verdun during World War I.

"We shall say to our foes, as they said, 'Ils ne passeront pas,'" Ashburn said. By the time "the tumult and the shouting dies," he continued, the barge service will have

† The Inland Waterways Corporation Act (43 Stat. 361) said the IWC "shall, as soon as there is an improved channel sufficient to permit the same, initiate the water carriage heretofore authorized by law upon the Mississippi River above St. Louis." A government suit against Edward Goltra delayed the start of such an operation. (Towboats and barges that the government seized in 1923 were returned to Goltra by an injunction on 4 September 1924. The pending suit sought their return to government custody.) Uncertainties in the status of the six-foot channel project also jeopardized the legal status of upper river barge operations because of the "improved channel" provision in the 1924 IWC act.

†† James Brodie, head of the River Transit Company, also visited Washington during December but not as part of the Twin Cities entourage. Brodie was concerned with selling his barge fleet, and he discussed that prospect with members of the War Department and Minnesota's Congressional delegation. During its brief existence, Brodie's company ran into problems that plagued steamboat lines a half century earlier: The cost of transferring cargo from warehouses to the riverfront was prohibitive and, as a consequence, his fleet had not brought cargo to the Twin Cities for two years. Brodie wanted his fleet to be "absorbed" by any IWC operation on the upper river, and Representative Newton advised him that plans for extending government barge service would do just that (*St. Paul Pioneer Press*, 3 December 1925, 13 December 1925).

delivered to the Twin Cities "an undreamed era of prosperity." However, Ashburn was aware that the incentive for promoting the barge service may have been rising railroad rates more than any advantage of shipping by water.

"It has, at times, been my unpleasant duty to point out to the ardent advocates of water transportation that killing or hurting rail transportation, using water competition solely as a club to cause the reduction of rates on railroads . . . thus benefitting particular communities fortunately located, at the expense of all the taxpayers, is neither fair nor politic," he said. Such activity, he noted, "irritates those who are being taxed without commensurate return."<sup>15</sup>

On 20 January 1926, Ashburn, Thorpe and Wiprud signed an agreement for building and operating a barge fleet on the Upper Mississippi River. The contract obliged the Upper Mississippi Barge Line Company to build barges and towboats for an IWC operation between St. Louis and the Twin Cities. The IWC agreed to pay annual rent equal to five percent of the fleet's construction costs and to buy the equipment, at cost minus depreciation, at the request of the barge line anytime after two years of the contract signing.<sup>16</sup>

For the next six months, officers of the Upper Mississippi Barge Line Company arranged loans and stock subscriptions to pay for the new towboats and barges, estimated to cost \$600,000, and for the salaries of traffic solicitors, estimated to cost \$70,000. Between February and April 1926, company officials negotiated a \$500,000 mortgage on the unbuilt equipment with the Minneapolis Trust Company and the Minneapolis investment company of Lane, Piper and Jaffray, Inc. Barge line officers also began to sell stock at \$100 a share to raise an additional \$170,000. The barge line presented stock purchases as a public

service, not as a profit-making venture, and each certificate carried the notice:

*The Subscriber realizes that the value of the said stock is speculative and this subscription is made in the nature of a donation to a public enterprise, rather than as an investment. The subscriber specifically agrees for himself, his successors, heirs, and personal representatives, that none of the said stock shall be sold until the earnings of the said Company places the stock on a dividend paying basis.*

The company sold almost 1700 shares. The majority were bought by businesses and individuals in the Twin Cities, and two of the largest purchases were made by the company's own directors. Deere and Webber Company, which Charles Webber headed, bought 50 shares in March; Burton Peek bought 91.5 shares in May, and Webber himself bought 50 shares in August.<sup>17</sup> Webber also became president of the barge line in August after Samuel Thorpe resigned and took a position on the IWC advisory board. (Willard Morse resigned as company vice president in February 1927 and became operating manager of the the Upper Mississippi Division of the IWC.)<sup>18</sup>

During the summer of 1926, Webber and the company's counsel, Arne Wiprud, signed contracts with the Dubuque (Iowa) Boat and Boiler Company and the Midland (Pennsylvania) Barge Company to build two sternwheel towboats and 11 barges. The IWC later contracted with the same companies to build a third towboat and four more barges for the upper river fleet.<sup>19†</sup> The three towboats—the *S.S. Thorpe*, the *C.C. Webber* and the *General Ashburn*—were launched late in March 1927 and the IWC made its first trip to the Twin Cities five months later.

The return of river traffic was big news in St. Paul and Minneapolis. "RIVER TRAFFIC REOPENS AS BARGES DOCK HERE" ran across the top of the 25 August 1927 edition

† In June 1926, the IWC regained possession of the Goltra fleet when the U.S. Supreme Court reversed the 1924 injunction by a Missouri district court that had returned the barges to Goltra's custody (271 U.S. 536). The IWC also bought equipment from Brodie's River Transit Company, paying about \$65,700 for five barges and two tugboats. It operated the equipment between Winona, Minnesota, and St. Louis (U.S. Congress, House, *Mississippi River from Minneapolis to Lake Pepin*, 69th Cong., 2d sess., 14 December 1926, H. Rep. 583, pp. 36-7; E.H. Hobe papers, undated newspaper clipping, Minnesota Historical Society, St. Paul).

of the *St. Paul Pioneer Press*. It was "Minneapolis-to-the-Gulf Day," and Minneapolis papers ran feature stories, editorials and advertisements that heralded the return of barge traffic. "CITY GREETES BARGES TODAY" was the banner headline across the top of the *Minneapolis Tribune*, and "BARGES' ARRIVAL OPENS ROUTE TO SEA" ran across the front of the *Minneapolis Journal*.

The *Journal's* lead editorial confirmed that railroad rates motivated the return of barge service to the Twin Cities. "It was navigate or starve in the old days," the editorial said. "It is navigate or be at the mercy of the railroads and an unsympathetic Interstate Commerce Commission in the new day.

"Opening of the Upper River as a highway finds shippers ready to use that highway. . . . It means, in time, water-compelled reduction of railway rates. It means, in time, the wiping out of those rate discriminations endured by the Twin Cities in the years since the powers that rule the rails decreed that water competition, to influence freight car rates, must be actual and not theoretical."<sup>20</sup>

Several days later, the *S.S. Thorpe* headed downstream hauling four barges filled with 50,000 bushels of grain and some other merchandise. During the remaining six weeks of the 1927 shipping season, IWC barges hauled about 14,000 tons of cargo on the upper river, including 1,000 tons of farm implements to Minneapolis from Deere and Company factories in Moline.<sup>21</sup> The IWC inaugurated its first full season of barge service to the Twin Cities on 4 April 1928, when the *S.S. Thorpe* pushed four empty barges into St. Paul.<sup>22</sup> About a week later, an IWC towboat headed downstream pushing barges filled with ladders, auto accessories, and wheat—bound for export at New Orleans—that had been loaded at the Equity terminal in St. Paul.<sup>23</sup>

A month after the 1928 shipping season started, the officers of the Upper Mississippi Barge Line Company decided to sell the boats and barges they helped bring to the upper river. They exercised their option to have the government buy the equipment, and in June 1928 the IWC paid almost \$583,000 for the barge fleet. The IWC payment covered the company's mortgage and, when combined with money on hand, left the Twin Cities company with more than \$95,000 in surplus funds, a bankroll it promptly invested in government bonds.<sup>24</sup>

Five days after the sale, Webber and the other barge line officers met for lunch at the Minneapolis Club, where Webber explained that the company would now devote itself to a new project—the establishment of a deeper channel on the Upper Mississippi River. Groups from the Twin Cities, including the barge line, had been on record in support of a deeper channel since 1925.<sup>†</sup> With a \$95,000 war chest on hand, the Upper Mississippi Barge Line Company launched a campaign to pressure Congress and the Corps of Engineers to drop the existing six-foot channel project and commit to a nine-foot channel.<sup>26</sup> The company had restored regular traffic on the Upper Mississippi River; now it would promote a project to transform the river itself.

### ***New Moves on the Upper Mississippi***

For six decades, the U.S. Army Corps of Engineers had worked on the Upper Mississippi River, doing so in the interests of navigation but with little success against prerogatives of business or forces of nature. Commerce had not abandoned the rails for the uncertainties of the river, and nature still rendered the river impassable for much of the year. Congress continued to authorize

† A delegation of about 30 people from Minneapolis and St. Paul, including the mayors of both cities and members of the newly-formed Upper Mississippi Barge Line Company, voiced their support for a nine-foot channel at the November 1925 convention of the Mississippi Valley Association in St. Louis. The public announcement was made "in view of the fact that Chicago is making a desperate effort to connect with the Mississippi River by a nine foot channel," according to an article in *The Realtor*, the weekly publication of the Minneapolis Real Estate Board. A nine-foot channel on the upper river and the proposed Illinois River channel "would mean a direct waterway from Minneapolis to Chicago: (*The Realtor*, Vol. 10 [1 December 1925], No. 21, p.2).

work on the river, though, and the Corps continued to carry it out. By 1928, the St. Paul and Rock Island district offices had spent two decades dredging the river and building wing dams to try to establish a navigable channel that was six feet deep.

Uniform and stable channel depths in the Upper Mississippi River would remove some uncertainties for river traffic—if it existed. A channel deeper than six feet would allow vessels to move between the upper river and the lower Mississippi River, the Ohio River and the proposed Illinois River channel. It also would allow heavier barge shipments and increase the potential profits on them.

New rivers and harbors legislation took shape in Congress during 1926, and it included two projects for the Upper Mississippi River. Oscar Keller, a U.S. representative from St. Paul, introduced the first one in February as the House collected authorizations for the bill. Keller's amendment authorized an examination of the Upper Mississippi River "with a view to securing a channel depth of nine feet at low water," and it was part of the bill approved in June and sent to the Senate.<sup>26</sup>

Prospects for commerce on the Upper Mississippi River were subject to occasional comment during Senate hearings on the bill, but they were drowned by the debate over the Illinois River proposal and its potential impact on Great Lakes shipping. The House version of the rivers and harbors bill would authorize a nine-foot-deep channel on 230 miles of the Illinois River.<sup>27</sup> The Illinois River proposal coincided with a presidential commission's examination of the St. Lawrence River as a link between the Great Lakes and the Atlantic Ocean, and legislators attacked the Illinois project as a threat to the proposed St. Lawrence seaway.

The Illinois River did not naturally connect with the Great Lakes: The artificial connection was made in the late 1890s,

when the Sanitary District of Chicago built a canal between the Chicago River, which emptied into Lake Michigan in downtown Chicago, and the Des Plaines River, a tributary of the Illinois River. The district opened the canal in 1900, diverting water from Lake Michigan through it to flush Chicago's sewage down the Illinois River and through central Illinois.

The sanitary district built the canal to reduce contamination of Chicago's drinking water supply in Lake Michigan, and it had permission from the Secretary of War to divert lake water into this open sewer. The district later received permission to use even more lake water, and by the mid-1920s legislators from Great Lakes states worried that the diversion was lowering lake levels and threatening navigation on them. A proposed nine-foot channel on the Illinois River worried them even more, because they feared that larger water diversions were part of the navigation scheme.<sup>28</sup>

"We of the Northwest are going to insist on our right to an outlet from the Great Lakes to the Atlantic Ocean," said Representative William L. Carss of Minnesota in testimony before the Senate commerce committee in June 1926. "We can dredge and blast channels, we can build locks and dams, but we must have water on which to operate ships. The diversion at Chicago seriously threatens the successful operation of our proposed seaway. It is unjust to our Canadian neighbors and to all the people in the upper Mississippi Valley, and we stand squarely on our rights to use the water of the Great Lakes watershed, Chicago to the contrary notwithstanding."<sup>29</sup>

Representative William Wallace of Ohio blasted the canal as the work of "wicked iconoclastic barbarians" and lamented the violence of their engineering. "Lake Michigan is bleeding to death through that ugly wound in her side," he told the Senate committee.<sup>30†</sup>

† Wallace's comments on the canal and its makers were especially colorful. "They have reversed God's plan for the Chicago River until its thirsty, bloody maw is sucking the lifeblood from the greatest transportation agency ever executed by divine thought for the benefit of mankind," he said. "The belly of this inhuman monster, the Chicago Drainage Canal, conceived as an unnatural offspring of the diseased mind of some cyclopean deity presiding over the unhappy destinies of the Windy City, is receiving the offal from the foul recta of the city sewers and is vomiting the filth into the Illinois River and its once beautiful valley" (U.S. Congress, Senate, Committee on Commerce, *Improvement of Rivers and Harbors: Hearings on H.R. 11616*, 69th Cong., 1st sess., 1926, p. 57).



Representative Theodore E. Burton of Ohio criticized the Illinois River plan on several counts. In testimony before the Senate committee, he noted that the Illinois River waterway would benefit little from an exchange of traffic with the Upper Mississippi River.

"I have been on that river, up and down it, again and again," Burton said. "There used to be a large traffic in floating logs; there used to be excursion boats running from St. Louis to St. Paul, but that traffic has almost disappeared . . . . The freight that is on the river there is carried short distances to an intersecting railway which crosses the river, and then is shipped away by the railway. Whether we like it or not, that is the fact with regard to the Upper Mississippi, so I do not believe you would get very much traffic into this Illinois River from the Upper Mississippi."<sup>31</sup>

A U.S. representative from Wisconsin, James A. Frear, also criticized the Illinois and Mississippi river projects. "Why at this time, above all others, try to create a waterway by using lake water that today is required by the shipping interests on the Great Lakes, the greatest inland waterway in the world?" Frear asked.<sup>32</sup>

A deeper channel on the Upper Mississippi River didn't appeal to Frear either, even though his district bordered it. "I suppose I would be considered the recreant if I did not vote for it," he said. "It goes right past my district for a hundred miles or more, but I think it is a fraud, because there is no commerce to come there . . ."<sup>33</sup>

The commerce committee report to the full Senate, submitted in June 1926, had provisions for both the Illinois River project and the Mississippi River study.<sup>34</sup> When Congress reconvened in December, Senator Henrik Shipstead of Minnesota quietly added a provision to authorize a major construction project on the Upper Mississippi River.

During 1926, the St. Paul district office of the Corps of Engineers had examined 37

miles of the Mississippi River below St. Paul as part of the six-foot channel project. The 1925 rivers and harbors act, which authorized the Corps to continue work on the channel, had ordered a survey of the river between St. Paul and Lake Pepin "with a view to improvement by the construction of locks and dams."<sup>35</sup> In his report, the St. Paul district engineer, Major Robert C. Williams, said "work which has been done on that section of the river . . . has not resulted in obtaining full project depth." The report, which was sent to the House rivers and harbors committee in December 1926, suggested that "the most economical plan" for establishing the channel below the Twin Cities would be construction of a \$3.8 million dam near Hastings, Minnesota. The pool behind the dam would create a channel at least six feet deep from Hastings to the High Dam at Minneapolis.<sup>36</sup>

At the time the House received the report from St. Paul, the pending rivers and harbors legislation was in the Senate, where critics were attacking the Illinois River proposal and legislators were so busy adding amendments for pet projects that the chairman of the commerce committee lost track of the total authorization.<sup>37</sup> In the midst of this caterwauling, Shipstead submitted an amendment to authorize the Hastings project.<sup>38</sup> Shipstead's amendment, as well as Keller's earlier amendment for the nine-foot channel survey, survived settlement of the Illinois River debate and were included in the bill the Senate approved on 21 December 1926.<sup>†</sup> The amendments were untouched by the House and Senate conference committee that negotiated the final version of the bill, and they became part of the rivers and harbors act of 21 January 1927.<sup>39</sup>

The two Upper Mississippi River projects had firm support in Minnesota. The Upper Mississippi Barge Line Company moved the Hastings project along by loaning the Corps of Engineers \$30,000 to help the St. Paul district office finish surveys and planning

† A section of the 1927 rivers and harbors act (44 Stat. 1013) authorized \$3.5 million for establishing a nine-foot deep channel on the Illinois River between its confluence with the Mississippi River, at Grafton, to Utica, 230 miles upstream. This section contained the proviso that "nothing in this Act shall be construed as authorizing any diversion of water from Lake Michigan."

ahead of time.<sup>40</sup> In addition, the state Legislature created a commission to promote "improvement, development, maintenance and protection of the upper Mississippi River for the purposes of navigation."<sup>41</sup>

The restoration of commercial navigation on the Upper Mississippi River moved slowly during 1927 but accelerated during 1928. The IWC began its first full season of shipping on the upper river, Congress examined new legislation to allow the IWC to expand, and the Corps of Engineers moved ahead with work on two separate river projects. Staff at the St. Paul district office completed surveys and plans for the Hastings lock and dam and signed contracts for the dam's construction while engineers at the Rock Island district office began preliminary studies of a nine-foot channel between St. Louis and the Twin Cities.

### ***Players on Center Stage***

Navigation on the Upper Mississippi River appealed to diverse commercial groups in the Twin Cities and the upper river valley during 1924 and 1925. Owners of businesses such as wholesale grocery and hardware stores felt stung by ICC decisions on rail rates, and efforts to restore commercial navigation offered at least a holding action against additional rate hikes if not an offensive to recover lost advantages. However, the people who guided the lobbying for IWC barge service and the nine-foot channel had specific commercial interests in the Twin Cities, primarily grain shipping in St. Paul, where a large grain terminal was being reorganized, and farm implement sales in Minneapolis, where manufacturers and dealers were dealing with harsh competition.

The 1920s were a decade of transition for the farm implement business. At the turn of

the century, horses provided most of the energy used on U.S. farms, but the refinement of the gasoline engine, its application to farm machinery, and the demand during World War I for increased crop production and labor-saving devices established new markets for farm machinery. Minneapolis was both a major market for farm implements and a home for implement manufacturers. Minneapolis Threshing Machine Company, Toro Manufacturing Company and Minneapolis Steel and Machinery Company all were located in Minneapolis or its immediate area. Minneapolis also had more than 40 dealers of agricultural implements and machinery, including dealers for J. I. Case Plow Works, J. I. Case Threshing Machine Company, Massey-Harris Harvester Company, International Harvester Company, and Deere and Company. Deere and Company, the world's largest manufacturer of steel plows and the nation's second largest manufacturer of other farm equipment, had plants on the Mississippi River at Moline, Illinois, and a system of branch distributors in Minneapolis, St. Louis, New Orleans, Kansas City and Omaha.<sup>42</sup> The Minneapolis branch house was operated by Charles Webber, the president of the Upper Mississippi Barge Line Company.

Other farm implement manufacturers in Minneapolis worked with the Upper Mississippi River Barge Line Company, but Deere and Company was most deeply involved in the company from the time of its incorporation. Top Deere officers were involved in both the Upper Mississippi Barge Line Company and the company's lobbying for river projects. Charles Webber and Burton Peek, both directors and vice presidents of Deere and Company, were major financial backers of the barge line, and Webber was president of the venture for virtually its entire existence.<sup>†</sup>

† The officers of Deere and Company may have hoped that restoring waterborne commerce on the Upper Mississippi River would lower freight rates on rail shipments through the river valley between St. Louis and the Twin Cities, given that both its Moline plant and Minneapolis branch house were on either rail lines or spurs. However, the company did not wait for river transportation to affect rail rates; it actually shipped machinery out of the Moline plants by water. The company shipped about a thousand tons of implements from Moline to Minneapolis during the fall of 1927 when the IWC began its barge runs to the Twin Cities (U.S. Congress, *Hearings on H.R. 10710*, 28 March 1928, p. 90).

The interest of Deere and Company in river transportation was matched by that of a St. Paul attorney involved in St. Paul's waterfront grain terminal. George Charles Lambert, a member of the entourage that promoted IWC service to the Twin Cities in 1925, was actively lobbying for river commerce at the same time he was overseeing the dissolution of the Equity Cooperative Exchange.

Internal strife at the Exchange turned into public litigation after an arrangement for grain pooling during the 1921 season failed. In 1923, some participants in the grain pool sued officers of the Exchange, charging that they had "utterly failed and neglected to perform their official duties."<sup>†</sup> The suit asked that the court appoint receivers for the Exchange and that its holdings be sold and divided among stockholders after debts were paid. A district judge ordered George Lambert and another St. Paul attorney to serve as receivers and to oversee the sale of Exchange holdings. The organization owned 29 country elevators in Minnesota, 49 elevators in North Dakota and one elevator in South Dakota, but its crown jewel was its 500,000-bushel terminal elevator in downtown St. Paul.

From the ruins of Equity Cooperative Exchange, stockholders organized the Farmers Union Terminal Association. They swapped Exchange stock for shares in the new association, which had been incorporated under the name Equity Union Marketing Association. As the sale of country elevators proceeded, the new association

continued to operate the St. Paul terminal, an operation which appeared more promising after IWC barge service to the Twin Cities began in August 1927.

"The operations of the Terminal Elevator at St. Paul . . . offer opportunities for further development through the inauguration of navigation on the Mississippi river," Lambert wrote to the court in February 1928. "A substantial movement of grain for export through the Equity Terminal was started last fall and promises to increase materially in volume during the season of 1928."

As the dissolution of the Exchange continued during 1928, Lambert actively supported the IWC barge service and work on the nine-foot channel. In doing so, he presented himself as the head of the Upper Mississippi and St. Croix River Improvement Commission, created by the Minnesota legislature; as the chairman of the Mississippi Valley Shippers Conference; and as a director of the Upper Mississippi Barge Line Company.<sup>††</sup> He rarely mentioned his involvement in the Equity Cooperative Exchange, his participation in the Farmers Union Terminal Association, or the interests of its stockholders in the waterfront grain terminal.

The attorney for the reorganized grain exchange and officers of Deere and Company were not alone in their desire to restore commercial navigation on the upper river. Through the Upper Mississippi Barge Line Company, the lobbying drew support from a manufacturer of road construction equipment, the Russell-Grader Company of

† See Emil Piper et al. v. Equity Cooperative Exchange, filed 30 January 1923 in Ramsey County (Minnesota) District Court, file number 150484. The suit "was the beginning of the end for an organization that was to expire largely as a result of self-inflicted wounds," wrote Theodore Saloutos in "The Decline of the Equity Cooperative Exchange," *Mississippi Valley Historical Review*, Vol. 34 (December 1947), No. 3, pp. 423-4.

†† The Mississippi Valley Shippers Conference included two other members of the Upper Mississippi Barge Line Company: Wiprud, secretary of both the barge line and the shippers conference, and Richmond Warner, a director of the Upper Mississippi Barge Line Company and a vice president of the Mississippi Valley Association. Other members of the shippers group were Frank Townsend, traffic director for the Minneapolis Traffic Association, a creature of the Minneapolis Civic and Commercial Association and the Minneapolis Chamber of Commerce; Herman Mueller, traffic director of the St. Paul Association of Commerce; John Peterson, a member of the Minneapolis city council; Alf Godward, executive engineer of the Minneapolis Committee; Harry Feltus of Minneapolis, a former traffic manager with the Van Dusen-Harrington Company; Theodore Brent of New Orleans, president of a New Orleans steamship line and a former manager of the IWC barge line; Lachlan MacLeay of St. Louis, a representative of the Mississippi Valley Association; Robert Isham Randolph, a Chicago engineer; and William Allen of New Orleans (Upper Mississippi Barge Line Company papers, Minnesota Historical Society, hereafter cited as UMBLCo.; Minutes of meeting of Mississippi Valley Shippers Conference, 8 March 1929).

Minneapolis; the Minneapolis wholesale hardware firm of Janney, Semple, Hill and Company; and a Minneapolis lumber firm, Rogers Lumber Company. However, the influence of representatives from these and other companies in barge line affairs and Washington lobbying appear secondary to that of agents from the St. Paul grain terminal and Deere and Company.

During the agitation for federal projects on the Upper Mississippi River, the barge line's main lobbyist in Washington was its legal counsel. Arne Clarence Wiprud, a Minneapolis attorney in his mid-30s, had previously worked as a vice president of the Federal Land Bank in St. Paul, as an attorney for joint stock land banks in New York, and as counsel for the Minneapolis investment company of Lane, Piper, Jaffray, Inc. Wiprud spent three years shuttling between Washington and the Twin Cities to establish the IWC barge service on the Upper Mississippi River; he would spend five more years shuttling back and forth trying to commit the federal government to creating a deeper channel on the upper river.

The barge line's legislative point man was Senator Henrik Shipstead of Minneapolis, a known supporter of navigation on the Upper Mississippi River. The barge line relied heavily on Shipstead to get its proposals onto the Congressional agenda, especially when they were tied to rivers and harbors bills.<sup>†</sup> These bills originated in the House and often were loaded with projects for eastern states. Given the greater representation those states had in the House, the Minnesota lobbyists had more leverage in the Senate with Shipstead's support, and they used this leverage to get their pet project in the pending rivers and harbors bill.

By 1928, the Upper Mississippi Barge Line Company had proven effective in getting federal support for waterborne commerce to the Twin Cities, and it assumed the position previously held by the Minneapolis Real

Estate Board as a central body for promoting such projects. The company had money in the bank, an energetic and effective attorney on its payroll, and the ear of a U.S. Senator. In 1928, the Twin Cities company put this financial and political machinery in gear to carry a new plan for the Upper Mississippi River through Congress. At the outset, the plan was vaguely defined, but it evolved into the transformation of more than six hundred miles of the river's ancient path.

### *New Surveys, New Perspectives*

The job of examining the Upper Mississippi River "with a view to securing a channel depth of nine feet at low water" had fallen to Major Charles Hall, district engineer at the Rock Island office of the Corps of Engineers. Hall's preliminary report was supposed to determine whether a full-scale survey of the river should be undertaken, and he decided against it. On 25 August 1928, Hall reported that the maximum savings that would accrue to transportation on the nine-foot channel, when multiplied by the potential traffic, were "entirely insufficient to repay the minimum cost of the proposed improvement."<sup>43</sup> His position surprised and angered supporters of the deeper channel project in Moline and Minneapolis, including the officers of Deere and Company.

"Major Hall's report is a surprise to me," Burton Peek wrote to Webber. "I was told, only a few weeks ago, that, despite his doubts concerning the project, he would favor a survey."<sup>44</sup>

Lambert called Hall's report "disturbing" and his findings unjustified. "If the lower river and Ohio are entitled to a nine-foot channel," Lambert said, "then the upper Mississippi river also is entitled to one."<sup>45</sup>

<sup>†</sup> Shipstead was elected to the Senate in 1922, and he had unusual influence during the last two years of his first term. As a member of Minnesota's Farmer-Labor party and the only third-party member of the Senate, he was a swing vote between the 47 Democrats and 48 Republicans who held seats after elections in November 1926. Even with the vote of Vice President Charles Dawes, Republicans controlled only half the Senate at best, and they wooed Shipstead in late 1926 to attract his vote on issues that might be decided along partisan lines (*New York Times*, 18 and 30 November 1926).

Hall's superiors returned the negative report for reconsideration, and Hall wrote to chambers of commerce in numerous river towns, including Minneapolis, to say he would consider additional information from "interested parties" regarding the river project. He met with Lambert and members of the Mississippi Valley Shippers Association in St. Paul in November 1928 at an informal hearing.<sup>46</sup> The meeting was private, at the request of Hall and officials of the War Department, and it focussed on river navigation as it affected the Twin Cities.<sup>47†</sup>

Citizens from other communities on the upper river promptly complained to the Chief of Engineers that they had not been represented, directly or indirectly, at the meeting. As a consequence, Hall conducted a public hearing in St. Paul in January 1929.<sup>48</sup> The hearing did not convince him that a deeper channel was justified, though, and he filed a second negative report on 23 February 1929. The Twin Cities group immediately moved to appeal the action.

"The people of the valley want a nine-foot channel and they will get it," Warner said.<sup>49</sup> Twin Cities lobbyists prepared an appeal to the Board of Engineers for Rivers and Harbors, a section of the War Department that Congress established in 1902 to handle waterways legislation. On 23 and 24 April 1929, supporters of the nine-foot channel made their arguments before the Board of Engineers and walked away confident of success.

Their confidence was justified. A month later, the board overrode Hall's reports and agreed to survey the river for a nine-foot channel.<sup>††</sup> A five-member board, including Hall as a subordinate member, was appointed to conduct the investigation.<sup>50</sup>

No sooner had the survey been approved than the Twin Cities lobbyists began to plot a strategy to get the channel proposal before Congress. The same day the board announced its decision to conduct the

survey, Lambert wrote to Frank Clague, a U.S. representative from Minnesota, warning that "we are not yet out of the woods."

"Our objective is the Rivers and Harbors Bill which will be reintroduced in the December session," Lambert said. "To reach that bill we must have a report upon which the action of Congress can be based." Lambert worried that Corps' district engineers could "drag along this survey" so long that they would be unable to insert it into pending rivers and harbors legislation. "Once the project is adopted, we will be on the express train; just now we are still on the slow freight, and our immediate concern is the speed with which the survey will be made," Lambert said. "If we can concentrate our efforts on that one point, we will materially advance our cause."<sup>51</sup>

The issues presented by the Twin Cities lobbyists—the ICC decisions, rising rail rates, and the alleged "cheapness" of water transportation—were not the only issues that concerned people along the Upper Mississippi River during the 1920s. The degradation of much of the river had affected many communities, particularly those downstream from the Twin Cities. Like Chicago, which funneled its sewage into the Illinois River, Minneapolis and St. Paul had constructed sewer systems in the late 1800s that emptied into the Upper Mississippi River. By 1900, the river was an open sewer for a metropolitan population in excess of 360,000, and it was a dump for industrial waste that included sawdust and bark from Twin Cities sawmills and bloody water and animal parts from St. Paul's packing houses.<sup>52</sup> Pollution worsened during the first decades of the 1900s and became especially gross when the Corps of Engineers closed the High Dam between Minneapolis and St. Paul to produce electricity. For the first seven years after its completion in 1917, the Corps opened the dam in winter to flush sewage sludge out of the pool behind it. After the

† Arthur R. Rogers, an officer of the barge line company, wrote to Representative Walter Newton that "Minneapolis was given a preferred position in the presentation and was the only community in the entire Mississippi valley that was represented at the conference with Major Hall" (Rogers to Newton, 27 December 1928, UMBLCo.).

†† Although it recommended the survey, the board also maintained that it was "not convinced of the advisability of the improvement" (U.S. Congress, House, *Mississippi River, Between the Mouth of the Missouri River and Minneapolis, Minn.*, 71st Cong., 2d sess., 1930, H. Doc. 290, p. 7).

Corps signed a contract in 1924 to sell hydroelectricity to the Ford Motor Company assembly plant in St. Paul, the dam stayed closed all year and the pool's sludge and scum became a serious nuisance.

Twin Cities pollution was not just a local problem: It sometimes degraded the Mississippi River so thoroughly that no fish survived in the 45-mile-stretch below St. Paul.<sup>53</sup> The Twin Cities were not alone in this abuse, though. Urban waste, deforestation and farming practices affected the upper river along much of its length.<sup>54</sup>

Industrial or commercial development alarmed some people as much as pollution. The giant hydroelectric dam at Keokuk had not only failed to deliver on its promise of prosperity; it also had flooded a long stretch of the river and the scenery, fishing spots and swimming holes that local residents had taken for granted. Threats of "development" or pollution affected other stretches of the river and prompted re-examination of human use of the river. Two of the most significant developments during this period were the formation of the Izaak Walton League and the creation of the Upper Mississippi River Wild Life and Fish Refuge.

The Izaak Walton League, named after the author of *The Compleat Angler*, was formed in 1922 by a group of businessmen who loved outdoor recreation, and it became one of the nation's largest conservation groups within two years. Its leader, Will Dilg, propelled the group to national prominence with his campaign to create a 300-mile-long wildlife refuge along the Upper Mississippi River between Wabasha, Minnesota, and Rock Island, Illinois. Dilg's campaign began with an effort to stop the proposed drainage of about 13,000 acres of wetlands south of Lansing, Iowa, and it developed into a proposal to create the Upper Mississippi River Wild Life and Fish Refuge. The refuge plan was signed into law in June 1924—with an amendment that declared the primacy of navigation work on the Mississippi River and prohibited "any interference with the operations of the War Department in carrying out any project now or hereafter adopted for the improvement of said river."<sup>55</sup>

People in the river valley were concerned by prospects that the nine-foot channel

might be established by a series of locks and dams similar to the High Dam in Minneapolis and the one under construction at Hastings. They believed that such a project would trap pollutants, flood lands and damage or destroy wildlife habitats such as the upper river wildlife refuge. Henry Ward, national president of the Izaak Walton League, wrote the Chief of Engineers in June 1929 to express concern that a lock and dam system on the Upper Mississippi River would destroy "one of the largest and one of the most potentially productive wildlife refuge and recreational areas on the entire continent."<sup>56</sup> The Corps' Major Hall shared these concerns, and he voiced them in August 1929 before the American School of Wildlife in McGregor, Iowa.

Hall told his audience that the nine-foot channel was likely to involve a series of dams that would create long, slackwater pools, and that the project would "radically change" habitats along the upper river. Hall agreed that the changes would drive animals from the river and complicate sewage disposal. In his address, he encouraged public discussion of these environmental aspects of the lock and dam project.

"In the past, those opposing complete development on biological grounds usually have been inarticulate and, consequently helpless," Hall said. "The engineer's duty in a gathering like this is to present the case in clear language, in order that all intelligent portions of the electorate may form their own opinion on the merits of the case. It is possible, by engineering means, to decide whether a proposed improvement is economically justifiable. It is certainly impossible to determine by engineering means whether certain advantages to water-borne commerce justify a partial destruction of existing wild life. The public can, however, properly demand that the biological effects of a proposed movement be stated before it is adopted."<sup>57</sup>

Hall's remarks outraged some people. The *Minneapolis Journal*, itself a minor stockholder in the Upper Mississippi Barge Line Company, ran an editorial that questioned Hall's "gratuitous opinions" on "matters which are entirely up to Congress." The editorial writer asked "why Major Hall

should worry about flora and fauna at all. His duties are neither floral nor faunal, but engineering."<sup>58</sup>

This attack on Hall was not unprecedented. Earlier in 1929, just after Hall issued his second negative report on the nine-foot channel survey, the Minnesota Legislature passed a joint resolution that sought support from the President, the Secretary of War, and Congress for the deeper channel because Hall had "overridden the protests of the Mississippi Valley Shippers Association and of shippers generally throughout the Northwest, and has recommended to the Secretary of War in opposition to the establishment of a nine-foot channel on the upper Mississippi River."<sup>59</sup> Governor Christianson signed the resolution on 27 February 1929, just four days after Hall's adverse report was announced.

Two weeks after Hall made his remarks at McGregor, George Lambert wrote Secretary of War James W. Good to express his overall concern with the pace of the Corps' survey of the upper river and to make special mention of Corps officials—"notably Major Charles L. Hall of the Rock Island district"—who were "not in sympathy with the project." In a telegram to the Secretary of War, Senator Shipstead obliquely warned that "it would be unfortunate and against public policy if collateral matters are permitted to interfere with the immediate completion of the survey."<sup>60</sup>

Hall's comments at McGregor were among his last public remarks on the nine-foot channel. The War Department, without comment, relieved Hall on 25 October 1929 of his duties on the special board examining the nine-foot channel.<sup>61</sup>

### ***Hoover's Uncertain Support***

The Twin Cities lobbyists for the nine-foot channel project may not have had the support they wanted—or claimed—in the Upper Mississippi River valley. However, they had a strong potential ally in the White House. Herbert Hoover, elected president in November 1928, had voiced strong support during his tenure as Secretary of Commerce

for commercial navigation on the nation's waterways. His speeches were frequently repeated by advocates of waterway projects and were reprinted in academic journals and popular digests such as *The Annals of the American Academy of Political and Social Sciences* and *Review of Reviews*. Hoover's speech in Kansas City on 19 October 1925 was one of these widely cited addresses.

"Today we must speed the development of our water in its aid to the land—power, irrigation, and above all, transportation," Hoover said. "This will test our vision and our statesmanship, for we must consider these questions not alone in the light of needs today, but of those beyond our time and generation." Hoover cited familiar claims that waterborne commerce would relieve railroad congestion and do so at cheaper rates. He also claimed development of waterways would mitigate the spread of "overgrown cities" around railroad centers. These advantages, he added, would require "the shifting of the grooves of trade."<sup>62</sup>

Hoover repeated these themes in testimony before the House rivers and harbors committee in January 1926 and in an address to the Mississippi Valley Association on 14 November 1927. In the latter speech, delivered in St. Louis, he also spoke of unifying the Mississippi River system into one vast transportation network through projects on the upper and lower Mississippi River, the Ohio and Missouri rivers, and the Illinois River waterway.

"By these works and the gradual improvement of channels up the other tributaries as traffic warrants, we shall at last replace (sic) a series of disconnected segments of river improvements into a great transportation system," Hoover said.

"Curiously enough," he continued, "I find that some of the press in outlying parts of the country still have the lingering notion that we are trying to restore the romantic steamboatin' days with gay river steamers whistling down the reaches, with possible Mark Twains aboard. I am not adverse to romance when it can be had without cost to the taxpayers. What we are trying to do lacks that color, but carries much more freight. What we want is to deepen the streams so that they become unfailing channels for

flocks of steel barges, shepherded by puffing tugs."<sup>63</sup>

As President, Hoover continued to voice his support for development of the nation's waterways. In October 1929, when he spoke in Louisville, Kentucky at the dedication of the nine-foot channel on the Ohio River, he pointed to the Mississippi River as a vital link in the nation's waterway system.

"We should complete the entire Mississippi system within the next five years," Hoover said. "We shall then have built a great north and south trunk waterway entirely across our country from the Gulf to the northern boundaries . . ." (However, Hoover's comments on the Mississippi River did not refer specifically to the stretch between St. Louis and the Twin Cities.) Waterways projects, Hoover continued, were not idle fancies of dreamers or sentimentalists: They were part of "the march of the Nation."<sup>64</sup>

Hoover delivered his remarks in Louisville the day before the "Black Thursday" collapse of the New York Stock Exchange. As the dislocations of the financial disaster rumbled through the nation's economy, serious shortages of government money would weaken the efforts to promote a nine-foot channel on the Upper Mississippi River. In late 1929 and early 1930, though, proponents of the deeper channel were most worried about a shortage of time. The second session of the 71st Congress was ready to convene and the Corps of Engineers had not finished the survey the lobbyists had fought so hard to obtain.

### ***The Key Legislation***

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In September 1929, the Secretary of War assured supporters of the nine-foot channel that the Corps would finish its survey of the Upper Mississippi River in time for the Congressional session that was to begin in December. In early January 1930, channel supporters received bad news. The Corps had not finished its interim report, and the report was being written in the context of continuing work on the six-foot channel project. In addition, a final report on the

deeper channel would not be ready until December, and that report would be reviewed by the War Department before it was formally submitted to Congress.<sup>65</sup>

Officers of the Upper Mississippi Barge Line Company advised Shipstead of their "distress" over this delay and Shipstead took the matter to General Herbert Deakyne, an assistant chief of engineers in the Corps. Deakyne replied that the Corps' special rivers and harbors board might send a preliminary report on the nine-foot channel to Congress early.<sup>66</sup> The Twin Cities lobbyists were not assured by this news, though, and they prepared for a prolonged legislative ordeal in Washington. In a letter to Walter Newton, a former Minnesota representative who had become a secretary to President Hoover, Webber expressed his determination to see the entire project authorized in the pending rivers and harbors bill.

"This nine-foot channel will cost a lot of money and our enemies will not be inactive," Webber wrote. "They will try in various ways to put it off or compromise and do something to prevent its authorization by Congress, but now is our time. We have a friend in the White House, President Hoover, the Mississippi Valley is back of us and we must let nothing come up that will defeat the nine-foot channel being authorized by Congress at this session."<sup>67</sup>

Three barge line officers—Wiprud, Lambert and Warner—and some other lobbyists traveled to Washington early in February 1930 to meet with Minnesota's Congressional representatives and officials from the War Department. The lobbyists wanted the complete project in the pending rivers and harbors bill with the expectation that a raft of other rivers and harbors projects would buffer its passage through Congress. "We want our eggs in the big basket," Lambert said. "We do not wish to come carrying them into Congress in a little sack by ourselves."<sup>68</sup>

The group met with the current Chief of Engineers, General Lytle Brown, who told them a final report on the nine-foot channel would not be ready until late in 1930 or early in 1931. Brown would not recommend that Congress authorize the project without a final report, but he said Congress could



approve continued work on the Upper Mississippi River "with a view towards a nine-foot channel project." The Twin Cities lobbyists were not satisfied by this suggestion or Brown's assurance that he would send a report on the channel to Congress "in a few days." They wanted a complete report and full funding. (In addition to their frustration regarding the Corps' report, the lobbyists also learned that Hoover would not support immediate construction of the entire nine-foot channel under any circumstances.)<sup>69</sup>

Brown followed through on his promise to provide an early report, but the preliminary report, released 13 February 1930, was heavily qualified and composed largely of material from the 1929 survey conducted by the special board of engineers.<sup>70</sup> The special board had filed a plan that was geared toward a six-foot channel but "adaptable to an ultimate depth of nine feet." The project's first phase had a \$50 million pricetag and included six new locks and dams between the Hastings dam and the mouth of the Wisconsin River, a distance of about 185 miles; construction of a new lock in the Keokuk dam; and construction of a new lock and dam to replace the canal around the Rock Island rapids. The project's second phase would cost about \$48 million and would include construction of 11 new locks and dams between the Wisconsin and Illinois rivers.<sup>71</sup>

The preliminary report also included a report from the Board of Engineers for Rivers and Harbors, a critical statement which noted that the project was based on incomplete studies, its plans were tentative, and its probable cost was undetermined. The report continued:

*It is not certain that the number of locks and dams proposed by the special board will be adequate, even their type is not determined, their location can not be definitely fixed...*<sup>72</sup>

The Board of Engineers recommended that "final action be deferred until the survey has been completed" and that work during the 1930 construction season be devoted to the six-foot project.<sup>73</sup> Wiprud wrote Webber that he was not enthusiastic about the Corps' report "despite the optimistic

headlines of the newspapers . . . Our hope seems to lie in the U.S. Senate, where we can hold the bill until we can force the detailed report."<sup>74</sup>

While the Twin Cities lobbyists were pushing for their project, President Hoover was pushing back against a wave of proposals for new or expanded government projects. In a press conference in February 1930, he asked for restraint in "the unprecedented drive" for new legislation and expansion of old services.

The Twin Cities lobbyists had a hard fight ahead of them in Washington, given Hoover's attitude and the contentious nature of the pending rivers and harbors bill. Hearings on the bill, the first rivers and harbors legislation since 1927, had begun in January, and the bill contained \$100 million worth of projects at the start. The committee was not amenable to any and all proposals in light of Hoover's stance regarding government economy, and a St. Paul newspaper reporter wrote that "it is understood" that the committee had agreed to exclude the Upper Mississippi River project from the pending bill.<sup>75</sup>

Wiprud, Warner and Lambert returned to Washington in March to testify before the rivers and harbors committee. Lambert, identifying himself as the chairman of the Mississippi Valley Shippers Conference, told the committee on 18 March that "the present six-foot project is entirely inadequate, and that to continue under the present authorization will be a pure waste of time and money. What we are asking is that Congress declare itself in favor of the nine-foot channel a little more clearly than the Chief of Engineers, and provide for this development and the improvements recommended in this report until this next survey comes in."<sup>76</sup> Lambert went on to state specific language for a provision in the pending rivers and harbors bill that would authorize "a minimum channel depth of nine feet" on the Upper Mississippi River. Two days later, Minnesota legislators submitted bills that contained the same language. Representative Nolan's bill was referred to the rivers and harbors committee; Senator Thomas Schall's bill was referred to the Committee on Commerce.<sup>77</sup>

Representatives from Minnesota, Iowa and Illinois spoke in favor of the nine-foot channel. Twice during their testimony, Dempsey reminded the legislators that Corps officers had made a special effort on behalf of the Upper Mississippi River lobbyists to provide an interim report.

"They have gone out of the rule and have presented what is really an interim report on your project, favorable—not only not unfavorable but favorable—and they say that they will complete their survey as soon as they can," Dempsey said. "I want you to get the correct idea, which is that you had a most unusual procedure in your favor, and that everything is being done that can be done, and that all rules of procedure have been disregarded in your favor."<sup>78</sup>

This special effort to provide a report did not translate into advantages during the House committee's final action on the pending bill. The rivers and harbors bill was expected to have carried more than \$150 million in authorizations but, in early April, the rivers and harbors committee began trimming authorizations at Hoover's request. The Upper Mississippi River project didn't fare well amidst these cuts.

"We are locked out more completely than I had at first suspected we would be," Shipstead wrote to Webber on 12 April 1930. Nine days later, the House rivers and harbors committee submitted its proposal for the 1930 rivers and harbors act to the full House. The committee essentially approved the nine-foot channel project, but it recommended only a fraction of the work envisioned for the Upper Mississippi River. The Twin Cities lobbyists had claimed anything less than full authorization for the \$98 million project would be "fatal," but the rivers and harbors committee was recommending just \$3,058,000 to pay for some dredging and construction of two new locks—one at the high dam in the Twin Cities and one at the Keokuk dam.<sup>79</sup>

Among the other items included in the committee recommendations were a \$7.5 million authorization for continued work on the Illinois River project and a provision for the federal government to take over two canals in New York—the home state of Dempsey, the chairman of the rivers and

harbors committee.<sup>80</sup> This latter provision authorized the Secretary of War to take over and operate New York's Erie and Oswego canals as navigable waterways; it also sparked a political crisis in Washington. Proponents of the St. Lawrence seaway route between the Great Lakes and the Atlantic Ocean considered the proposal to be a step toward adopting an "all-American waterway" to the sea through New York. Their objections, coupled with complaints of the Upper Mississippi River groups, threatened to defeat the entire rivers and harbors bill.<sup>81</sup> Minnesota representative Melvin Maas charged collusion between the New York and Illinois groups and pledged to block the bill to get an authorization for a nine-foot channel on the Upper Mississippi River.<sup>82</sup> James Frear, a Wisconsin representative who had vocally opposed the 1927 rivers and harbors bill, also attacked the New York canal takeover.

"No pork barrel in all recent history has been of equal significance to this one," Frear said. The 1930 bill "contains many worthless projects," he said, and foremost among them was the New York canal proposal.

"The insertion of the canal item ought to defeat the bill," Frear said, "but that result seems hopeless, because it contains over 150 projects, for which authorizations occur running from a few hundred dollars to many millions per item, and in addition the bill includes nearly 350 surveys, all of which are expected to bring votes for the bill. Five hundred projects and surveys ought to cover every nook of the 48 states, as is usually the practice, so as to insure enough votes against its defeat, although not one half of these separate projects would be passed by the House if subject to a separate vote. Only by an omnibus bill or pork-barrel method can they be placed on the Government pay roll."<sup>83</sup>

The bill came before the full House for debate the following day. Dempsey hailed provisions for the Upper Mississippi River—two new locks in existing dams—as "a splendid and long start in the process of obtaining a nine-foot channel."<sup>84</sup> Minnesota's Representative Nolan didn't see the provisions in the same light. After the clerk read the section of the rivers and

harbors bill regarding the upper river, Nolan offered an amendment to replace this "valueless project" with an authorization for the entire nine-foot channel.

"The adoption of my amendment will authorize a nine-foot channel in place of the present valueless project contingent upon a final favorable report by the engineers," Nolan said. "It does not provide for any appropriation of money; and, if not adopted at this time, we are certain it will be a long time before this matter can again be considered by Congress."

Dempsey took issue, arguing that the cost of the upper river project would jeopardize the entire bill. "The whole question here is whether you are going to get any rivers and harbors bill at all," Dempsey said. "With the Upper Mississippi project in it, the bill would never pass the White House."<sup>85†</sup> The House did not favor this prospect and buried Nolan's amendment in a 146-41 vote.<sup>86</sup> Later that day, the House passed the rivers and harbors bill and sent it to the Senate.

Lobbyists for the nine-foot channel had one last chance to obtain broader authorization for their project during the Congressional session. To succeed, they would have to amend the authorization while the rivers and harbors bill was in the Senate, see it through the Senate, and then shepherd it through a House vote on the revised bill. The lobbyists had anticipated this situation and made a strong showing during Senate hearings in May. Wiprud, Warner and Lambert again traveled to Washington, this time to testify before the Senate Committee on Commerce. In addition to the officers of the Upper Mississippi Barge Line Company, witnesses included Minnesota Senators Thomas Schall and Henrik Shipstead, Minnesota Representative William Nolan, Minneapolis Mayor William Kunze, Minneapolis city councillor John Peterson, traffic experts from Minneapolis and St. Paul business associations, the secretary of the Mississippi Valley Association, and two businessmen from Dubuque, Iowa.

The witnesses were most concerned that the 1930 rivers and harbors act authorize the complete nine-foot channel project, and they were less concerned—at least publicly—with a full appropriation for its construction. Schall's amendment to the pending legislation would put Congress on the record in support of the complete project but would not commit it to immediate funding. Schall was the first witness during the hearings on 6 May 1930 and suggested that Congress authorize the project and back it with a \$15 million appropriation.

*This authorization, with this small appropriation would definitely decide that the nine-foot channel is a reality and not a campaign promise. The President promised my people that this nine-foot channel would be completed in five years. . . . If definite authorization with an appropriation were made, these improvements could be carried on all along the river. It is vital that this present rivers and harbors bill include my amendment. If it is not done, two, three, or even five years may elapse before such action is taken.*<sup>87</sup>

Lambert said the existing authorization for work on the Upper Mississippi River gave "a nine-foot color" to the project but did not clearly and firmly establish a nine-foot channel as the intent of Congress.

"Our people are entitled to at least a declaration by Congress, unequivocal in terms, upon which they can base plans for the reconstruction of their industries, the relief of their agriculture, and the economic development of their landlocked country," he said. Lambert identified himself as the chairman of the Upper Mississippi River improvement commission and the Mississippi Valley Shippers Conference, although he noted that he had been "specially requested" by the Farmers' Union Terminal Association (the group that replaced the Equity Cooperative Exchange) to present their views to the Senate committee.<sup>88</sup>

† Dempsey later had the statement that the bill would "never pass the White House" deleted from the Congressional Record (St. Paul Dispatch, 16 May 1930).

Warner observed that the project authorization approved by the House allowed some construction "on a nine-foot basis" and said that was reason enough to authorize a complete nine-foot channel project.

"If two dams can be recommended on a nine-foot basis," he said, "this confirms the report of the special board that the project should all be on a nine-foot basis, and proves that it is meritorious."<sup>89</sup>

Other witnesses discussed the value of the nine-foot channel for shipping export grain and farm implements. A deeper channel would cut transportation costs and offer grain shippers an alternative to the Great Lakes, said a traffic expert from the Minneapolis Traffic Association, a body of the Minneapolis Civic and Commercial Association.

"It has been demonstrated by actual tests we have made in the movement of grain on the upper Mississippi River that the six-foot channel operation is not economical," said Frank Townsend. "The small barges operated on the upper Mississippi River will hold during high water transportation approximately 18,000 bushels of grain . . . . The larger barges on operation on the lower Mississippi River would carry 60,000 to 70,000 bushels of grain . . . . That affords economic transportation, and without that we can not get our grain through to the Gulf."<sup>90</sup> The IWC barge line, which was shipping grain from the terminal in St. Paul, apparently was not delivering on T.Q. Ashburn's earlier promise of an "undreamed era of prosperity" with only a six-foot channel.

A traffic expert for the St. Paul Association of Commerce, Herman Mueller, claimed a deeper channel would reduce the shipping costs of agricultural implements.

"The upper Mississippi Valley is probably the largest market for agricultural implements of any similar area in the world," Mueller said. "The transportation charges on these implements go directly into the farmers' cost of production. These charges will be materially reduced by an improved and standardized channel in the upper Mississippi River. The principal points of manufacture of agricultural implements are so located that with an improved upper

Mississippi, a very substantial portion of this agricultural implement movement will be via the water routes."<sup>91</sup>

Shipments of agricultural implements also concerned Theodore Brent, a witness from New Orleans. Brent, a former manager of the federal barge line, was the president of Redwood Steamship Line, which operated between the Gulf of Mexico and ports on the Pacific coast. He supported a deeper channel on the Upper Mississippi River because it would improve access from northern river ports to the Gulf. However, he said Congress had to clearly establish the nature of the project. Communities along the river, he said, were reluctant to build riverfront terminals because the pending navigation project and its effect on river levels was uncertain. Brent said this was especially true at Moline, the home of Deere and Company.

"Four years ago the city of Moline authorized the expenditure of \$300,000 for the building of terminals," he told the Senate committee. "They have not issued bonds; they have not gone a foot. Why? Because they do not know what the level of the pool is going to be in front of Moline."

Clear support for the nine-foot channel, Brent said, would remove these uncertainties, encourage construction of river terminals and—at Moline—allow machinery to be loaded on barges and shipped straight to New Orleans.

"One of the biggest movements we have out of the upper Mississippi River today is the implement tonnage from Deere, now moving both to the north and to their northwest Canadian agencies and to the south and to the Pacific coast. The Redwood line is handling about a thousand tons of implements clear around to Seattle, San Francisco and Los Angeles. . . . With a terminal those implements can be loaded into the barge at their plant just as cheaply as they can be loaded into a car."<sup>92</sup>

Two familiar issues also figured into testimony before the Senate committee. Witnesses argued for the nine-foot channel, just as they had argued for federal barge service to the Twin Cities, by claiming that a deeper channel would mitigate disadvantageous shipping costs. Although increased rail rates were mentioned,

witnesses more frequently cursed the Panama Canal for restraining the Midwest economy. Proponents of a deeper channel on the Upper Mississippi River argued that the Panama Canal had so greatly cut transportation costs between the east and west coasts that the Midwest no longer could ship produce and merchandise to western markets at competitive prices. The Mississippi River "must be used on a large scale, if we are to get relief from our present intolerable situation and for which the Panama Canal is largely responsible," Mueller said.<sup>93</sup> Along with these arguments over freight rates were crude but familiar demands for a piece of a juicy fiscal pie.

"Minneapolis is part of the United States," said John Peterson, a Minneapolis city councilor. "We have no objection to how much money is spent in the South and East, but, as I said, we want our share."<sup>94</sup>

On 21 May 1930, the Senate commerce committee voted 15 to 4 to revise the nine-foot channel section of the rivers and harbors bill. The revision clearly directed the Corps to work on a nine-foot channel on the upper river and increased the total authorization for such work to \$7.5 million.<sup>95</sup> The revised authorization for the Upper Mississippi River project was the best news that its proponents had yet received.

"This is a complete victory for upper river brought about by Senator Shipstead and his colleagues," Wiprud said in a telegram to Lambert. "Only veto can stop authorization of project now."<sup>96</sup>

The commerce committee sent its report to the full Senate on 22 May 1930. A month later, the Senate approved an expanded rivers and harbors bill, one that included the nine-foot channel provisions, and returned it to the House for final consideration. The final version on the House floor included the Upper Mississippi River item as well as authorizations for \$7.5 million of work on the Illinois River and \$2.5 million for federal assumption of New York's barge canals. (This latter provision stated that the canals would be operated "as barge canals only, and not as, or with any intention to make them ship canals. . .")<sup>97</sup>

Dempsey urged that the House approve the Senate amendments, including those for

the Upper Mississippi River project.<sup>98</sup> His previous hostility to greater spending on the upper river had diminished somewhat, and he said opposition to the Senate version of the project "was on highly technical grounds" regarding the lack of a complete survey by the Corps.

"There can be no question that a complete and favorable report would be made on this project within a few months, and that if not adopted now it would be adopted with practically no opposition as soon as a new report should be made by the Chief of Engineers."<sup>99</sup> The House passed the revised rivers and harbors bill that afternoon. On 3 July 1930, President Hoover signed the 1930 rivers and harbors act and directed the Corps of Engineers to work on the Upper Mississippi River "so as to provide a channel depth of nine feet."<sup>100</sup>

Hoover said he took "particular satisfaction" in signing the bill as it represented final authorization of a waterways program he had advocated for five years. However, he qualified his remarks in a way that unnerved some advocates of the nine-foot channel. Hoover noted that the rivers and harbors projects comprised "a long-view plan for the future" that would require many years to complete. He also said: "Some of the items authorized have not yet been recommended by the engineers and, of course, they will not be undertaken unless they are so recommended."<sup>101</sup> By some accounts, this statement referred specifically to the nine-foot channel project, which Congress had approved with only a preliminary report from the Corps. Melvin Maas, a House member from St. Paul, was shaken by Hoover's comment.

"It is not the function of the executive branch of the Government to modify acts of Congress," Maas said the day after Hoover signed the bill. Other legislators were less worried about Hoover's statement, though.

"The President's statement does not mean any delay beyond completion of the survey by the special board, which should be ready by December," William Nolan said. Frank Clague echoed Nolan's sentiments. "The purpose of the authorization was to avoid two or three years' delay until another rivers and harbors bill is enacted," he said.

"With the nine-foot provision now safely in the law, when the engineers complete their survey in December they will not have to wait for another rivers and harbors bill to proceed with construction."

Wiprud was confident that Corps engineers would return a favorable survey. In fact, he expected nothing less.

"Congress has now determined the economic need for and the feasibility of the Upper Mississippi nine-foot project," Wiprud said. "It only remains for the engineers and the executive department to draw plans and construct the project. To say the engineers can negative (sic) the acts of Congress in adopting projects would be tantamount to saying that Congress has delegated to the engineers its legislative powers in these matters, and no one would seriously contend that it has done so."

Further recommendations from the Corps, Wiprud added, were unnecessary "except as to plans and methods of construction."

"With the signature of the President now affixed to the Rivers and Harbors bill, we now should turn our attention to early completion of the project," Wiprud said. "While this is the job of the Army engineers, they can proceed only as rapidly as funds are provided by Congress. It lies with our Senators and Representatives to provide these funds as rapidly as possible."<sup>102</sup>

## ***Staying Alive***

The inclusion of the Upper Mississippi River project in the 1930 rivers and harbors bill was a pivotal act in establishing the lock and dam system that today alters the river between St. Louis and the Twin Cities. The nine-foot channel scheme had been jeopardized at times by the Corps' inconsistent attitude and by legislative maneuvering that preceded final approval of the 1930 bill, but it had become law due to the persistent lobbying of a small, dedicated group that encountered few obstacles outside the federal government.

That situation changed during the first three years the authorization was on the

books. The nine-foot channel received less federal support than its proponents expected and it also began to attract legal and political challenges. Continued intervention by members of the Upper Mississippi Barge Line Company and Minnesota's Congressional delegation shielded the plan from these threats, and its future was finally secured within the massive public works program of Franklin Roosevelt's "New Deal."

The biggest threat to construction of the lock and dam system was a lack of money, and supporters of the nine-foot channel began to lobby for federal funding immediately after the 1930 rivers and harbors act became law. They also demanded higher priority. The Twin Cities lobbyists perceived a lack of zeal for the project on Hoover's part and believed that the Secretary of War, Patrick Hurley, shared the President's views. The Twin Cities lobbyists had never been patient with the federal government's progress and they were not pleased when they learned that the 26 August 1930 issue of the *United States Daily* carried a headline that read: "Mississippi Work to Continue for Century, Mr. Hurley Says." The story contained Hurley's remarks to the effect that Hoover's five-year work plan for the Mississippi River focussed on opening navigation from the Great Lakes to the Gulf of Mexico by way of the Illinois River. On a trip to the Twin Cities several days later, Hurley advised local advocates of the nine-foot channel that Hoover favored the "ultimate construction" of the project but that local interests could not expect to bind the administration to carry out its waterways program in five years.<sup>103</sup>

The officers of the Upper Mississippi Barge Line Company were concerned that project funding might be forgotten, and they spent the next three years in a constant battle for money. Webber himself addressed this issue before the Mississippi Valley Association at its convention in November 1930.

"Clearly the greatest problem of success of the waterway program is how to bring it to pass *now*," Webber said. "Therefore, I say that the greatest problem which confronts the Mississippi Valley and this Association is

how to bring the authorized waterway program to pass *now*.<sup>104</sup>

In December 1930, during a lame duck session of Congress, Shipstead introduced the first of several proposals to secure funds for the Upper Mississippi River project. His bill would allow the government to issue bonds to "provide for the early completion of the works of improvement on the adopted and authorized river and harbor projects."<sup>105</sup>

Neither Shipstead's bill nor a duplicate introduced in the House by the chairman of the rivers and harbors committee, Joseph Mansfield of Texas, went anywhere. However, Congress approved a contentious relief measure on 20 December 1930 from which about \$950,000 was applied to work on the nine-foot channel, specifically the lock and dam at Rock Island and Moline, Illinois.<sup>106†</sup>

The following year was marked by the deepening gloom of economic depression. Wages fell drastically and nationwide unemployment increased from four million in January 1931 to more than five million by the end of the year.<sup>107</sup> In the midst of this economic decay, work on Upper Mississippi River projects progressed slowly. With the exception of dredging and other routine maintenance, the Corps limited its work on the nine-foot project to sites at Hastings and Rock Island. The St. Paul district office condemned and cleared land that would be in the pool behind the Hastings lock and dam, and the Rock Island district office signed a contract for construction of a dam and two locks there.<sup>108</sup>

Work at a third site at Alma, Wisconsin, had been suspended by a federal injunction. The Chicago, Burlington and Quincy Railroad had track in western Wisconsin along the east bank of the river, and in November 1931 the railroad sought and received a federal injunction to stop work on the proposed dam at Alma. Its suit charged that the Corps had no authority to increase water levels there to the heights proposed

and that higher water levels would harm the railroad's track.<sup>109</sup> A federal judge in Madison, Wisconsin, issued a permanent injunction in January 1932 but it was soon nullified. An amendment to the 1930 rivers and harbors act, signed into law in February 1932, allowed the Chief of Engineers greater discretion in establishing the nine-foot channel and erased the basis of the injunction—the railroad's claim that the Corps lacked authority to raise water levels four feet higher than listed in its interim report on the nine-foot channel.<sup>110</sup> In June, the Circuit Court of Appeals returned the case to the federal district court with an order to dissolve the injunction, which it did in July 1932.<sup>111</sup>

The Corps completed its detailed survey of the Upper Mississippi River—the survey that was debated so much during 1930—and sent it to Congress in December 1931. The survey recommended that the nine-foot channel be established through construction of 24 locks and dams between Minneapolis and a site downstream from the mouth of the Illinois River.<sup>112</sup> The dams would create long "slackwater" pools behind them and transform the free-flowing river into a series of long lakes with a navigation channel at least nine feet deep. (Part or all of each dam would be comprised of long metal gates that could be adjusted to let varying amounts of water pass underneath. In spring, these gates would be lifted clear of the water to let ice pass.)

At the same time the railroad challenged the Corps on the project, landowners along the Upper Mississippi River began to worry about the effect the nine-foot channel would have on their property. Their concerns, voiced during hearings in 1932, were among the first criticisms of the lock and dam system brought before Congress.

During the 1910s, farmers along the Upper Mississippi and Illinois rivers built levees and dug ditches in wetlands and

† Construction at two other sites on the Upper Mississippi River concluded during the fall of 1930. The Hastings lock and dam was completed by November, although the Corps had not finished acquiring land that would be flooded when the dam was closed. Replacement of lock gates on the Minneapolis High Dam, which failed in August 1929, was finished by September 1930 (*Annual Report of the Chief of Engineers, U.S. Army, 1931*, p. 1211, 1217).

pumped water out of them to lower water tables enough to grow crops. By the mid-1920s, the districts had acquired reputations as projects that destroyed wildlife habitat, enriched speculators and left behind poor farms and farmers.<sup>113</sup> After plans for the nine-foot channel became known, landowners in these drainage districts began to worry that higher water levels would reduce what value their property had. They were not necessarily anxious to block the project, but if the lock and dam system were to be built, they wanted compensation for damages they might suffer. William F. Kopp, a U.S. representative from Iowa, brought these concerns to the House rivers and harbors committee during hearings in January 1932.

"We are not here to question the wisdom of the nine-foot channel project," Kopp said, "but a great project like that raises and precipitates other questions, and I am here today as the Representative of a congressional district that has quite a number of drainage and levee districts that will be damaged thereby."<sup>114</sup> Kopp had introduced a bill to compensate landowners for damage from higher water levels and to alleviate some their apprehension.<sup>†</sup>

While landowners along the river worried about property values, lobbyists for the nine-foot channel kept worrying about funding, and officers of the Upper Mississippi Barge Line Company reexamined prospects for a massive government bond issue to finance construction of the lock and dam system.<sup>115</sup> In November 1931, two barge line officers—Wiprud and Lambert—conferred with officials from the Mississippi Valley Association and drafted a bond bill similar to the ones Shipstead and Mansfield introduced a year earlier. Late in November 1931, during a meeting in Minneapolis, the barge line's directors approved the draft and instructed Wiprud to take it to Washington "with a view

toward securing its immediate introduction in Congress" by Shipstead and Mansfield.<sup>116</sup> In early December, Shipstead and Mansfield introduced bills to allow the government to issue \$500 million in bonds for rivers and harbors projects. Neither bill became law, but the arguments that flared during their brief lives illuminate the parochial support for the nine-foot channel against the backdrop of worsening economic depression.

Shipstead's bill came before the Senate commerce committee in April 1932. The list of witnesses at Senate committee hearings reveals the strong interest in the measure from specific interests in the Twin Cities and Moline as well as the apparent lack of interest from other communities along the Upper Mississippi River. The two members of Congress who testified were Shipstead and Representative Melvin Maas, both of Minnesota. Three of the five Twin Cities witnesses—George Lambert, George Hall, and Arne Wiprud—were members of the Upper Mississippi Barge Line Company. Two other witnesses, Burton Peek and Albert Ebi, were executives from the Deere and Company plant in Moline. Four other witnesses were close associates of the Twin Cities lobbyists who also had strong ties to the Mississippi Valley Association.<sup>117††</sup>

Hearings in the Senate on Shipstead's bond bill, and later hearings in the House on Mansfield's version of it, were overshadowed by pointed debate over relief legislation for the nation's unemployed.

The nation's deepening misery was dramatically captured in a march on Washington by thousands of unemployed World War I veterans—the "Bonus Army." The march began with 300 veterans from Oregon who supported a bill to authorize early payment of bonuses that Congress approved in 1924. Thousands of veterans who had been out of work for months, even years, joined the march, and as many as

† Kopp's bill died in the rivers and harbors committee, as did several other bills introduced in subsequent Congressional sessions. Congress finally approved compensation for landowners who were affected by the nine-foot channel project with a provision in the 1937 rivers and harbors act (50 Stat. 848).

†† These were Robert Isham Randolph of Chicago; Lachlan MacLeay of St. Louis; Halleck Seaman of Clinton, Iowa; and Theodore Brent of New Orleans. During 1932, both Brent and Seaman collected traveling and entertaining expenses for trips to Washington from the Upper Mississippi Barge Line Company ("Traveling Expenses and Entertaining for the year ended December 31, 1932," UMBLCo.).



20,000 eventually descended on Washington to support the bill. They camped out in vacant government buildings and shacks on flats along the Anacostia River. The bonus payment bill passed the House in June but failed in the Senate, and all Congress and President Hoover allowed the veterans were loans to pay for rail fare and subsistence for their trips home. Many of the veterans chose to stay in the Washington camps instead.<sup>118</sup>

Hoover was not strong on federal relief programs in spite of the worsening economic depression. He believed local communities and states had the primary responsibility for relief and said federal aid strikes at "the roots of self-government."<sup>119</sup> He became increasingly critical of proposals to expand public works programs as relief measures, especially when they involved "works of remote usefulness." (The American Society of Civil Engineers, for example, took a stand in favor of a \$3 billion public works program.) Hoover's disdain for this approach surprised many. He said the "vice" of such programs is that they often involve "non-productive works" that did not create income, and these works included highways, streets, and even rivers and harbors projects.<sup>120</sup>

Both the Senate and the House assembled and reassembled relief bills during May, June and July of 1932 in the face of likely White House vetoes. John Garner, speaker of the House and a potential Democratic presidential candidate, was a strong supporter of a relief measure that included a \$1 billion bond issue for public works.<sup>121</sup> The proposal allotted more than \$248 million to rivers and harbors projects under Section 311, a provision that appealed strongly to advocates of a deeper channel on the Upper Mississippi River. Among projects listed in the section was the lock and dam project for the Upper Mississippi River.

The House passed the Garner bill on 7 June 1930 with the river provision intact; the Senate passed its own relief measure three days later.<sup>122</sup> Hoover attacked both bills for their "pork-barrel characteristics," and his harsh denunciation dried up support for rivers and harbors funding.<sup>123</sup> The bill that emerged from a joint conference committee had only a \$30 million allocation for rivers and harbors projects, and the committee had

rejected the Upper Mississippi River project, a move that greatly distressed its supporters.<sup>124</sup> Webber received this news direct from Shipstead and in turn wired Wiprud, who was monitoring developments in Washington. Webber said he had encouraged Shipstead "to exert his greatest influence to have conferees change their mind and include our bill . . . whether the president vetoes or not to be forgotten is the worst thing could happen to us . . ."<sup>125</sup>

The House passed the new relief measure on 7 July, the Senate passed it on 9 July and Hoover vetoed it on 11 July. As legislators reworked an old bill into a new relief proposal, Wiprud expressed his disillusionment in a letter to Webber.

"This is the first time we have failed in our objective," Wiprud wrote. "Congress has been and is willing to adopt our program. President Hoover alone stands in our way. . . . In my humble opinion, our only chance for the speedy completion of our project lies in a change of Administration."<sup>126</sup>

On 13 July, Shipstead made one last attempt to get the Upper Mississippi River project into the Senate version of an emergency relief bill and failed.<sup>127</sup> The final version of the Congressional relief act carried a \$30 million authorization "for the prosecution of river and harbor projects heretofore authorized" but without specific application to the nine-foot channel or any other project. In the midst of ever-worsening depression, and after a prolonged legislative ordeal, the "Emergency Relief and Construction Act of 1932" was enacted into law on 21 July 1932.<sup>128</sup>

As the Congressional session ended and legislators headed home, the U.S. Army moved into the Anacostia Flats with tanks, tear gas and torches to clear the "bonus army" from its camps. On the night of 28 July, the Washington sky was lit by flames of burning shacks. The nation would see much worse during the harrowing winter of 1932 and 1933.

### ***Brief Challenge on Home Ground***

The Upper Mississippi Barge Line Company had not only met defeat in

Washington during the 1932 Congressional session; it had faced a legal assault on its home turf in Minneapolis. Cargill Elevator Company, one of the few grain companies that bought stock in the barge line during its 1926 fundraising drive, was isolating itself from the barge line and giving its officers some grief as it did so. In March 1932, Edward J. Grimes, a vice president of Cargill, wrote to Wiprud to advise him that "we do not want our name to be used . . . as sponsors of this movement."<sup>129</sup> Grimes first asked that the barge line simply cancel Cargill's share of stock, but he changed his request and asked for a copy of the company's articles of incorporation, bylaws and list of stockholders. The barge line refused out of fear that "the opposition" would use the list of stockholders "for the purpose of propagandizing them, and thus changing the present policy of the Company." The dispute entered Hennepin County (Minnesota) District Court when Cargill filed suit against the Upper Mississippi Barge Line Company in November 1932. Cargill sought access to barge line records in order to communicate with other stockholders because it believed the barge line had disposed of its physical assets and that "its working capital and funds on hand are being diverted, impaired and depleted for purposes which are outside the scope of the proper business." Barge line officials believed Cargill's suit was partly based on collusion between the elevator company and railroads. A "voting trust agreement," in which stockholders turned in more than half the barge line's stock issue and put their shares in the hands of three trustees, apparently defused Cargill's desire to gain access to barge line records and the case was stricken from the court calendar in January 1933.<sup>130</sup>

Given the company's failure in Washington and its brief challenge at home, the barge line officers moved to create a more public lobbying organization to promote its program. In September 1932, a barge line clone organized as a non-profit organization under the laws of Minnesota and the name of the Upper Mississippi Waterways Association. Charles Webber, the president of the barge line, was president of the new organization. Horace Hill, the barge line's

treasurer, was treasurer of the new organization. Arne Wiprud, the secretary and general counsel of the barge line, was general counsel for the new association. Its executive committee included other familiar figures, such as George Lambert, Burton Peek and Richmond Warner. Formation of the group was announced in a barge line report to stockholders, which noted that "appearances before Congressional Committees and other governmental bodies are now made in the name of the Upper Mississippi Waterway Association."<sup>131</sup>

Two months after the association formed, the nation's voters elected Franklin Roosevelt president. The lobbyists for the deeper channel on the Upper Mississippi River fell silent during the grim months after the election and during the whirlwind of Roosevelt's first month in office. In April and May, however, they began again to press for federal support of their pet project. By fall, they would have cracked the federal treasury for their piece of the New Deal.

### *The New Deal*

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The nation's economy was in a shambles by the time Roosevelt took office. At the beginning of 1933, employment and average weekly earnings in manufacturing industries were about 55 percent of what they had been in 1929, and the nation's unemployed numbered more than 10 million. Industrial production had fallen off by half and the nation's financial structure was so unsteady that one writer said Herbert Hoover left office to "the sound of crashing banks."<sup>132</sup> The winter of 1932 to 1933 was so appalling that it struck another writer as the chill of "a world's end." Historians sometimes say Roosevelt's greatest gift to the nation was that of hope when he declared, in his inaugural speech, that "the only thing we have to fear is fear itself."<sup>133</sup>

Roosevelt promptly took action to instill confidence in the banks and to protect the nation's gold supply. He also called a special session of Congress to grapple with the nation's economy and unemployment. Congress convened 9 March 1933, and

during the first hundred days of the Roosevelt administration it cooked up "alphabet soup" legislation that established the Civilian Conservation Corps (CCC), the Tennessee Valley Authority (TVA), the Federal Emergency Relief Administration (FERA), and the National Industrial Recovery Act (NIRA). Plans for waterways projects were lost in the tumult of the special session as legislators assembled programs for agriculture, industry and banking. However, Joseph Mansfield, the head of the House rivers and harbors committee, said in late March that he would not only try to include inland waterways projects in any public works law that might be promoted, but that he also would push for enactment of an entirely new rivers and harbors bill. The rivers and harbors committee quickly assembled a bill and held a week of hearings in late April and early May. Included in the bill was an \$11 million authorization for the Upper Mississippi River project.

As Mansfield pushed forward with the new rivers and harbors bill, Representatives from Iowa maneuvered against the nine-foot channel plan. Fred Biermann, a representative from a Congressional district in northeast Iowa, introduced a bill on 2 May 1933 to discontinue work on the deeper channel. In testimony before the rivers and harbors committee that day, Biermann said the channel would fail commercially and flood the Upper Mississippi River Wild Life and Fish Refuge in the process.

"There appears to be a disposition of the Almighty to make it impossible to provide commercial navigation for the Upper Mississippi River," Biermann said. "Whatever the reason was, the four-foot channel was a failure, and then a six-foot channel was attempted, and that has been a failure . . . I am sure I represent the feeling along the Upper Mississippi river, in the river towns, when I say they are against the nine-foot channel."<sup>134</sup>

Another Representative from Iowa, Albert C. Willford, joined Biermann in opposition to the deeper channel. Like Biermann, Willford was concerned about the fate of wildlife refuges along the river if the lock and dam system were built. Willford also discounted claims that the deeper channel would allow

cheaper transportation of agricultural products and coal. If Congress intended to help farmers, it would do better "to take the money and give it to the farmers outright" rather than invoke old claims about the benefits of water carriage, he said. As to freight rates on coal, Willford said, action by the ICC would be more effective in adjusting rates than the effort and expense of building the lock and dam system.

"The railroads have been very arrogant in fixing their prices for handling coal," Willford said, "but that is something that can be adjusted without spending an enormous amount of money in undertaking to make a canal out of the Mississippi River. I will tell you people that I do not expect to see it done. I do not expect to live long enough to see that, but if any of you are alive, you will be ashamed that you ever attempted to make a canal of the Mississippi river."<sup>135</sup>

Opposition to the project surprised some legislators and angered others. "This is the first time that I've ever heard a member of Congress oppose an improvement in his own back yard," one member of the rivers and harbors committee said to Biermann. Magnus Johnson, a Representative from Minnesota, was less bewildered and more outraged, and he reviled the opposition from northeast Iowa as a "rowboat outburst of Iowa duck lovers."<sup>136</sup>

Two Twin Cities lobbyists who regularly appeared in Washington, Arne Wiprud and Herman Mueller, both testified on behalf of the project. Wiprud blamed the sudden opposition to the project as work of "those who control the western railroads and those allied with them" and cited the "impelling economic need" for the deeper channel, especially for the export of agricultural products and the import of raw industrial materials.<sup>137</sup> Wiprud also called attention to the number of workers that would be employed in construction of the locks and dams. "Certainly no project has come to our attention that will employ more labor for the money expended than will this project," he said.<sup>138</sup>

Biermann returned to the hearings to repeat his criticisms and to attack some of Wiprud's assertions. He began by introducing into the record telegrams from

northeast Iowa that opposed the deeper channel. One telegram sent by residents of McGregor, Iowa, pleaded: "In the name of common sense and America at large do all you can against this awful graft."

Biermann proceeded to question Wiprud's assertion that a deeper channel on the Upper Mississippi River would benefit agriculture and industry in the upper Midwest. "If water transportation is the only factor that makes or breaks people," Biermann said, "what is the answer to these people . . . that have water transportation and have the Ohio River and the Mississippi River and the Great Lakes? I have never heard that farmers in those sections are more prosperous than they are in our section of the country. I have never heard that the factories there failed to close because they had water transportation. There are other things that enter into this business besides water transportation. There are many factors that enter into our prosperity."<sup>139</sup>

On the third day of the hearings, Edward Eicher, another Iowa Representative, asked the committee to consider a complaint voiced in earlier hearings—that of seepage from higher water levels and degradation of farmlands in drainage districts. Seepage would result in "the complete dispossession of all these landowners who have their life's savings invested," Eicher said. Such dispossession, he added, would be best remedied by government payment for their damages, payments that would likely be government purchases of their land.<sup>140†</sup>

That same day, the House committee also heard Minnesota Governor Floyd Olson speak in favor of the lock and dam system on the Upper Mississippi River. (Olson was in Washington to talk with government officials about federal loans to Minnesota communities.) During his testimony before the rivers and harbors committee, Olson repeated a complaint that had become familiar to committee members: that the upper Midwest was a "landlocked" victim of high rail rates, and routes to the sea were essential for its economic independence. Olson beseeched the committee to continue

the channel project to help the upper Midwest rid itself of "this monopolization of our grain markets" and give its industry cheaper coal and its farmers "enhanced prices because of the lowering of transportation rates on that which he sells and that which he buys."<sup>141</sup>

The hearings went into a fourth day, during which railroad executives suggested several amendments to the rivers and harbors bill, including one that would establish tolls on inland waterways where the federal government had spent money on navigation improvements.<sup>142</sup> Wiprud, of course, was there, as he had been every day, to defend the deeper channel. As the day drew to a close, he asked the committee to extend the hearings so other witnesses from the Upper Mississippi River valley could come to Washington to testify on behalf of the project. Even after motions were made and seconded to adjourn, Wiprud managed to keep the committee in session, but little came of the extended discussion. Hearings on the Upper Mississippi River project concluded that afternoon.<sup>143</sup> Three days later, the committee submitted a rivers and harbors bill that included \$11.6 million for construction of dams at three sites on the Upper Mississippi River where locks were nearing construction.<sup>144</sup> The bill, however, was lost as Congress processed a major piece of New Deal legislation, the National Industrial Recovery Act.

The NIRA was the third in a set of programs that Roosevelt and members of his cabinet had drawn up to deal with the nation's economic crisis. The first of these programs, enacted 31 March 1933, created the Civilian Conservation Corps. The second program made federal grants to states for relief efforts, and it was realized on 12 May 1933 with creation of the Federal Emergency Relief Administration and an allocation of \$500 million. The third program involved control of industry and employment conditions in a program that eventually became Title I of the National Industrial Recovery Act; Title II of the NIRA

† The 1937 rivers and harbors act included a measure sponsored by Eicher for relief to landowners.

complemented Title I with a massive public works program.

Two different groups were drafting proposals for a national industrial recovery act early in May, and both proposals focussed on controls over business activity. The two drafting parties met at the White House on 10 May 1933 and, after a joint conference, gave Roosevelt a compromise bill. However, the bill's public works section apparently did not have specific language regarding waterway projects such as the lock and dam system on the Upper Mississippi River. Its authors redrew the section dealing with rivers and harbors after a conference with Shipstead to include projects that were already adopted, a revision that qualified the Upper Mississippi River project for funding through the public works program.<sup>145</sup>

Roosevelt sent the proposed bill for national industrial recovery to Congress on 17 May, and four weeks later Congress sent back a bill containing a \$3.3 billion appropriation for public works. On 16 June 1933, the President's cabinet endorsed his plan to create separate offices to oversee Title I and Title II of the bill. The National Recovery Administration, under the auspices of the Department of Commerce, would oversee compliance with Title I; the Federal Emergency Administration of Public Works, better known as the Public Works Administration, would oversee the many projects that would be pursued under Title II. Harold Ickes, Roosevelt's interior secretary, would head the PWA.<sup>146</sup> Roosevelt signed the National Industrial Recovery Act into law that day and issued an executive order to create an advisory board—the Special Board for Public Works—for the Public Works Administration. The special board advised Ickes on matters of policy, administrative matters and allotments for projects, but Ickes was not legally bound by the board's decisions.<sup>147</sup>

Rivers and harbors work received a tremendous boost from the NIRA. The projects, which received \$178.6 million under the PWA, were ideal candidates for funding under Title II of the NIRA: Surveys and plans for many of them already were complete and so the projects could be started promptly and used to put people to work.<sup>148</sup>

About two weeks after Roosevelt signed the NIRA, Shipstead wrote to him to ask about the status of the Upper Mississippi River project within the public works program. Roosevelt replied that he told Ickes all projects in the Mississippi River valley should be considered as a whole before the Special Board made final decisions on them. Roosevelt also assured Shipstead that the nine-foot channel project would receive "careful and sympathetic consideration."<sup>149</sup>

The Special Board refused to approve the nine-foot channel project, though. At a cabinet meeting on 28 July, Ickes told Roosevelt of the board's refusal to approve the project on the Upper Mississippi River and another public works project in Wyoming. Roosevelt, in turn, wrote instructions to Ickes "to put these projects through at the next meeting of the board." At a press conference that afternoon, Roosevelt casually announced that both projects would be approved at the board's next meeting.<sup>150</sup> In early August, the Public Works Administration allotted \$11.5 million to work on the nine-foot channel on the Upper Mississippi River, and in mid-September it announced another allotment of \$20 million.<sup>151</sup> After years of lobbying, the federal government finally was committing the huge sums that would be required to complete the lock and dam system between Minneapolis and St. Louis.

The Twin Cities lobbyists celebrated the appropriations in October 1933 with a "victory dinner" in Minneapolis that was hosted by the Upper Mississippi Waterway Association and featured Henrik Shipstead as a guest of honor. With their major obstacles surmounted, though, the organization of lobbyists began to fade even as money for their project poured from the federal treasury. Wiprud left the Upper Mississippi Barge Line Company in October 1933 to become a special assistant to the U.S. Attorney General in charge of condemning land for the nine-foot channel project.<sup>152</sup> George Lambert, another regular lobbyist for federal work on the Upper Mississippi River, died in February 1934. In 1936, the Upper Mississippi Barge Line Company itself ceased to exist. At a meeting of the board of directors on 5 November

1936, an acting chairman noted that "there no longer existed any reason for the continuation of this company" and it dissolved on 10 December 1936, turning over its mission to the Upper Mississippi Waterways Association.<sup>†</sup>

The nine-foot channel project never achieved universal support inside the federal bureaucracy or in Congress. The Mississippi Valley Committee, which operated under the auspices of the Public Works Administration, submitted a report to Ickes in October 1934 that was skeptical of the value of transportation on the Upper Mississippi River. The committee noted that navigation on the upper river declined in the preceding century because the river, unlike the railroads, was "at right angles to the direction of traffic." Its report added:

*It is not possible by any calculations of business accounting to discover an economic justification for the vast expenditures on the projected improvement of these waterways; especially from the prevailing viewpoint of self-liquidation, but also even from the viewpoint of complete coverage of costs of maintenance and operation. It is the more impossible when consideration is given to the fact that diversion of grain traffic from railroads, which is included in present calculations, is quite likely to be checkmated by the highly probable development of through water traffic from the Great Lakes by way of the St. Lawrence river to the Atlantic.*<sup>153</sup>

The committee report dealt with issues regarding the entire Mississippi River system, including the Ohio and Missouri rivers, and this criticism of the nine-foot channel appeared on only one page of a

234-page document. The nine-foot channel's financial health was immune to this slight criticism: The project received \$20 million under the Emergency Appropriation Act of June 1934, and it received \$25 million under the Emergency Relief Appropriation Act of April 1935.<sup>154</sup>

Despite the tens of millions of dollars pouring into the project, Fred Biermann continued to oppose the project in the House. In May 1933, he had introduced a bill to discontinue the nine-foot channel project and he repeated the attempt in January 1935.<sup>155</sup> Both efforts died in the rivers and harbors committee. In April 1935, Biermann also tried to amend the pending rivers and harbors bill to prohibit the PWA from spending more money on the "criminal folly" called the nine-foot channel.<sup>156</sup> Although Biermann's amendment was voted down, the attempt may have prompted government bureaucrats to change the source of the project's funding, for subsequent allocations came from appropriations to the War Department. The nine-foot channel received a \$27 million allocation under the War Department Appropriation Act of May 1936 and a \$28.6 million allocation under the War Department Civil Appropriation Act of July 1937.<sup>157</sup> These allocations completed the major financing of the nine-foot channel project, and its allocation from 1938 appropriations for the War Department's civil works dropped to \$6 million.<sup>158</sup>

As the massive allocations poured out, the construction that was underway at two sites in 1933 was pushed to rapid completion, and work began at other sites between Minneapolis and St. Louis. The locks and dam at Rock Island were finished,

† John Clapper, president of Toro Manufacturing Company and a director of the barge line, presided over the company's last meeting. Clapper "called attention to the fact that the Company had disposed of all its assets in the furtherance of the nine-foot channel project, and that the work for this project now that the Upper Mississippi Barge Line Company had completed the mission for which said organization was incorporated, was being carried on by the Upper Mississippi Waterways Association; that there no longer existed any reason for the continuation of this company." (Upper Mississippi Barge Line Company Corporate Records, Vol. 3, UMBLCo.) As part of their joint "mission," the barge line and the Upper Mississippi Waterways Association hired Mildred Hartsough, a graduate of the University of Minnesota, to write a book about transportation on the upper river. Hartsough's doctoral dissertation, "The Development of the Twin Cities as a Metropolitan Market," is a detailed account of Twin Cities economic history and was a key reference for this manuscript. Her book about the river, *From the Canoe to Steel Barge*, is less comprehensive. (The book was published in 1934 by the University of Minnesota and is dedicated to Henrik Shipstead, "whose unflinching faith and courageous leadership have brought liberation to a landlocked midwestern empire.")

in 1934. In 1935, structures at Alma, Wisconsin—the site subject to the 1931 federal court injunction—were finished as were locks and dams downstream at Fountain City, Wisconsin. In 1940, the last of the 24 locks and dams were completed at Clarksville, Missouri. The pricetag for the whole project was more than \$164 million.

The circumstances surrounding federal projects on the Upper Mississippi River changed dramatically between World War I, when the government first engaged in commercial barge operations, and the beginning of World War II, when it finished most work on the locks and dams. Federal work on the upper river had grown from dredging and running a barge fleet to building and maintaining a complicated system of locks and dams. The arguments for government support of river commerce had changed from complaints about railroad congestion to complaints about railroad rates. The economic backdrop to the programs and promotions had changed most dramatically of all. The booming economy of the 1920s had given way to the Great Depression, a depression that crushed potential benefits of commerce on the Upper Mississippi River beneath threats to the very survival of businesses that might use the river. The Upper Mississippi Barge Line Company, however, operated in relative independence of this dramatic change in the economy. With the \$95,000 it banked in 1928, the barge line had a buffer against the depression and fuel for more than five years of lobbying. The company succeeded in getting the federal government to commit itself to establishing a deeper channel on the Upper Mississippi River, but only after reasons for the project had changed from relief for Twin Cities businesses to relief for thousands of unemployed Midwest workers.

The value of federal barge service and the lock and dam system to the Twin Cities

lobbyists and their colleagues would be difficult, if not impossible, to determine. The lobbyists were far more vocal about the potential benefits of river transportation than they were about the benefits they actually received. Even if the renewed river commerce offered lower transportation rates or nudged rail rates downward, the benefits were quite likely lost to the shattering impact of the Great Depression.

As the last of the dams went into place to trap the Father of Waters, a ghost of earlier grievances on the Upper Mississippi River completed a long passage through the courts. Edward Goltra, the St. Louis man who had promoted upper river commerce despite his tremendous failures at it, never accepted the resolution of his dispute with the federal government over the barge fleet taken from him in 1923, and his litigation against the government outlived him.

Goltra's fleet returned to federal jurisdiction after a 1926 decision by the U.S. Supreme Court, but Goltra insisted that he had been wrongfully deprived of his lease on the vessels and an option to purchase them. Senator Roscoe Patterson of Missouri introduced a bill into Congress in May 1933 that would confer jurisdiction over Goltra's complaint to the U.S. Court of Claims.<sup>159</sup> The bill was enacted in April 1934 and Goltra sued under the new law for damages from "the wrongful taking of the fleet," including interest from the time of the seizure in March 1923.<sup>160</sup> Goltra died in 1939 but his wife continued the suit and, on 1 April 1940, the Court of Claims awarded her \$350,000 and six percent interest. The U.S. Supreme Court affirmed the decision in 1941.<sup>161</sup> The settlement was minor compared to the \$164 million that the government spent to build the lock and dam system, but it was yet another reminder of the expense involved in offering "cheap" transportation by water.

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## CHAPTER V

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### *A River of Grain: The Upper Mississippi River, 1945-1985*

**T**he dams that trap the waters of the Upper Mississippi River have given humans some of the authority that once was exerted only by weather, but forces of global dimension continue to shape the river in ways that are outside any apparent human control. Each spring, as the northern hemisphere turns more squarely toward the sun, the snow that has blanketed the upper Midwest melts and pours into the Upper Mississippi River from uncounted rivers and streams. The human agency that traps the lesser waters of summer makes no attempt to control the energy unleashed by this changing of the seasons, and every spring lockmasters along the river lift the huge metal sections of the dams clear of the river's crest to let the torrents of water and ice pass freely.

The great natural forces that are unleashed in spring have shaped the river for thousands of years. In recent decades, the river has been shaped by other forces of global dimension but distinctly human origin. The demand in countries around the world for red meat and poultry has transformed the Upper Mississippi River into a river of grain that drains corn, wheat and soybeans from the center of the North American continent and empties these commodities into the markets and feedlots of the world.

The river's transformation into an agricultural artery is not one that can be described simply with terms of supply and

demand. The headwaters of this river of grain are fed by agricultural policies in the United States, Japan, the European Economic Community and the Soviet Union; by technological changes that set the productivity of U.S. agriculture far beyond the nation's domestic needs, and by changes in the foreign exchange value of the U.S. dollar. Since the end of World War II, changes in these components of world trade increased the volume of grain that flowed from U.S. farms into world markets. U.S. farmers, grain merchants and government bureaucrats rode this rising crest of grain exports from the early 1960s into the 1980s, and as they did, they laid heavier burdens of corn and soybeans onto the waters of the Upper Mississippi River.

Commercial navigation on the Upper Mississippi River has not come without expense, though, and both the federal government and the natural environment have paid a high price for this enterprise. The Corps of Engineers, which has responsibility for navigation on the river, has been obliged to continually dredge the river to counteract natural processes that would obliterate this submarine ditch. The river's wetlands, in turn, have been obliged to absorb spoil drawn from the river bed, and in some places these fertile environments have been turned into sterile sandbars.

The integrity of the Upper Mississippi River has become intimately connected with both the physical aspects of commercial

navigation and the economic complexities of international trade. Demand for Midwestern grain has created a matrix in which the health of fishing holes, clam beds and heron rookeries on the upper river is affected by the propwash of towboats and the exchange value of the dollar, by environmental guidelines of the Corps of Engineers and corn yields on foreign farms. In this international matrix, the concerns of environmental activists in river towns such as Lansing and La Crosse are linked to the decisions of officials in the White House and the Kremlin, to the profits of traders in the grain pits of Chicago and London, and to the diets of consumers in Tokyo, Paris and Moscow.

### ***Agricultural Headwaters: Domestic Policies And Foreign Markets***

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The domestic problems and policies that affect U.S. agriculture, especially the grain-based agriculture of the upper Midwest, began to emerge during the 1920s, the same period that saw the resurgence of interest in navigation on the Upper Mississippi River.

Demand for food from U.S. farms grew during World War I, and production on U.S. farms increased in response to this demand. The expanded capacity of U.S. farms had no outlet in European markets after the war, though, because the United States suspended wartime credits to the Allies, credits that could have been used to buy U.S. food.<sup>1</sup> Domestic agricultural surpluses and a decline in both the volume and price of U.S. exports began an economic squeeze on U.S. farmers that persisted through the 1920s and became murderous in the early years of the Great Depression. Within three years of the 1929 stock market crash, the net income of U.S. farmers had fallen by two thirds and prices for farm goods had fallen by half.

The Roosevelt administration tried to boost farm income by raising prices for agricultural products, using restrictions on crop production to do so, and it took additional steps to stabilize farm income with

price guarantees for certain crops. In October 1933, Roosevelt issued an executive order to create the Commodity Credit Corporation, a government body that would issue "nonrecourse loans" to farmers who would use their crops as collateral. Loans were set at a base price per bushel for certain commodities, such as cotton and corn. If market prices rose above this base price, the farmer could repay the loan and sell the crop at the higher price.<sup>2</sup> If market prices fell below the base price, the farmer could default on the loan and keep the money, and the credit corporation would repossess the collateral crop and store it. The level of such nonrecourse loans constituted a floor price for commodities, and it began to spur overproduction at the same time that it raised farm incomes. The Commodity Credit Corporation initiated a lasting bias in federal farm policies toward production increases, but the immediate consequences of this bias—the trend toward overproduction—were hidden by the devastation of severe droughts in 1934 and 1936. With the return of better crop seasons, surpluses began to develop, but they were consumed by increased domestic and foreign demand during World War II.<sup>3</sup>

The U.S. rural economy improved during World War II as crop prices rose and surpluses disappeared. After the war ended, U.S. foreign policy helped absorb the expanded production capacity of U.S. farmers and prevented a recession in the rural economy. Instead of ending foreign credits and calling in foreign debts, as the United States had done after World War I, the government extended financial aid in unprecedented amounts to war-ravaged European nations. This assistance included \$3.7 billion in loans to Britain 1946 and \$12 billion in loans to European nations under the Marshall Plan, and it precluded a serious decline in U.S. agricultural exports to Europe and even helped push domestic farm prices to a new high.<sup>4</sup>

Surpluses began to fill the storage bins of the Commodity Credit Corporation in the late 1940s, though. The 1948 corn crop reached a record 3.6 billion bushels and was followed by a 3.4 billion bushel harvest in 1949. Prices began to sag and exports began to

drop, but once again war drained off the nation's surplus. The Korean War, however, only put off the day of reckoning with crop surpluses that were encouraged by domestic policy and produced with the help of advanced agricultural technologies such as hybrid seeds, fertilizers and pesticides.<sup>5</sup> After the Korean War ended in 1953, the Eisenhower administration asked Congress for stronger export programs to dispose of new government surpluses. Congress responded in July 1954 by enacting the Agricultural Trade Development and Assistance Act, better known as Public Law 480. Perhaps the most exceptional feature of Public Law 480 was the provision under Title I that allowed sales of U.S. grain for foreign currency. Title I allowed poor nations that lacked hard currency reserves to buy U.S. grain, and this provision helped dispose of U.S. surplus stocks abroad.<sup>6</sup>

Programs like Public Law 480 accounted for a substantial portion of the growth in U.S. grain exports during the late 1950s. For example, exports made under Public Law 480 accounted for almost a quarter of feed grain exports for 1958-59, according to a 1959 report by the U.S. Department of Agriculture. "The special export programs of the U.S. Government have contributed greatly to larger coarse grain trade," said the USDA *Feed Situation Report* for November 1959. "Foreign currency sales of corn and grain sorghum to India and a number of other countries have, in effect, created a market that did not previously exist."

U.S. grain exports, especially of feedgrains, increased for several other reasons, the report said. In response to general economic recovery in Western Europe, consumers were demanding more meat and poultry, which in turn increased the demand by livestock and poultry raisers for more feedgrains. Western European production had not risen enough to satisfy this demand. As a consequence, Western Europe became the largest foreign market for U.S. feedgrain in the late 1950s, accounting for 75 percent of U.S. feedgrain exports during the 1958-59 crop marketing year.<sup>7</sup>

High price supports and technological advances prompted record domestic harvests, and growing demand for U.S.

feedgrains through both commercial and government channels did not prevent large surpluses from accumulating at home. Corn supplies, the sum of annual production and stocks carried over from the previous year, rose from four billion bushels in 1955 to five billion bushels in 1958 and six billion bushels in 1959.<sup>8</sup> By the time the Kennedy administration took office in January 1961, domestic grain production and surpluses had grown so large that the federal government spent \$500 million annually to acquire and store surplus wheat, and the cost of storing surplus feedgrain exceeded the value of the grain itself.<sup>9</sup>

The Kennedy administration took steps during its first year to cut grain production and to make U.S. grain more competitive on world markets. Its 1961 feed grain program tied eligibility for price supports to reductions in acreage planted to feedgrains, and the program cut corn acreage 22 percent and brought annual production below total use for the first time since 1951.<sup>10</sup> The Kennedy administration also lowered the loan rates that established price floors for grains, which cut prices for U.S. grain and stimulated demand for it on world markets.

These policy changes signalled an important shift in domestic attitudes toward foreign markets. U.S. agricultural policymakers and farmers had traditionally been wary of world grain markets, and they used them in the 1950s primarily as dumping grounds for surplus stocks. In the 1960s, though, they began to discard their suspicions and turned to world grain markets as lucrative sources of trade.<sup>11</sup>

Changes in U.S. policy and world demand established the United States as the world's largest participant in world feedgrain exports by the mid-1960s. U.S. feedgrain exports accounted for 50 percent of world feedgrain trade during the 1964-65 marketing year and the U.S. share rose to 60 percent the following year.<sup>12</sup> Exports rose as a percentage of total U.S. feed grain production from five percent in the early 1950s to 18 percent in 1965-66 marketing year.<sup>13</sup>

Western Europe still figured as the major overall market for U.S. feed grains during the 1960s despite the formation of the European

Economic Community (EEC or Common Market) and protective tariffs established under its Common Agricultural Policy.<sup>14</sup> Japan also began to import large amounts of U.S. feedgrains during the 1960s and it was the largest single importer of U.S. feedgrains during the 1963-64 marketing year.<sup>15</sup>

The Soviet Union became an important but uncertain grain buyer during the 1960s. The growth of Soviet grain imports was rooted in domestic policy changes that began when Nikita Khrushchev assumed power after Joseph Stalin's death in 1953. Soviet agriculture had taken a backseat to heavy industry for decades, and Khrushchev wanted to direct more investment into agriculture and more food and other goods into Soviet consumer markets. His reforms included larger investments in agriculture and the cultivation of new farmland, and they raised gross agricultural output between 1956 and 1960 by 40 percent over output for the preceding five years. However, a severe drought in 1963 contributed to a 20 percent drop in the grain harvest that year, and feedgrain shortages reduced rations for the Soviet Union's precious livestock and poultry inventories. Khrushchev turned to world markets for grain to limit the resulting "distress slaughter" of livestock and poultry and simultaneous reductions in consumer bread supplies. The Soviet Union eventually bought more than 10 million metric tons of grain on the world market, mainly from Canada and Australia: It also bought a small amount of grain from the United States but the purchases were hampered by politics, coming only a year after the Cuban missile crisis and in the midst of widespread anti-Soviet sentiment in the United States.

The Soviet decision to import grain rather than restrict consumer rations marked the Soviet Union's emergence as a wild card in the world grain trade. It also marked a turning point in Soviet domestic policy, for it was the first time that the nation's consumers were not forced to tighten their belts in response to agricultural problems. However, the 1963 drought and the lack of a sufficient grain reserve seriously weakened both Soviet agricultural productivity and Khrushchev's political standing. Domestic meat production fell 20 percent in 1964 and

Khrushchev fell out of power completely that October. However, the new Soviet leadership, headed by Leonid Brezhnev, maintained Khrushchev's focus on agriculture and his efforts to increase domestic meat production. The continued emphasis on domestic meat production led to massive Soviet imports in the early 1970s.<sup>16</sup>

U.S. grain sales to the Soviet Union in 1963 were hampered by requirements that half the grain had to be loaded on U.S. vessels, a requirement Kennedy invoked in response to domestic pressure from politicians and labor unions.<sup>17</sup> The provision would have raised shipping costs for the Soviet Union, and it dampened Soviet interest in U.S. grain. That policy changed in 1971, though, due to the weakness of the dollar, Vietnam War-era inflation and an imbalance of international trade and payments. A presidential commission had recommended that the United States "launch a vigorous export drive" to overcome these imbalances and said agriculture should be one of its key elements. The Nixon administration lifted the U.S. grain shipping requirement in June 1971, and that October, the Soviet Union purchased more than three million tons of U.S. feedgrains. (The move came in response to both the end of the maritime restriction and a devaluation of the U.S. dollar which made U.S. products cheaper to foreign buyers.<sup>18</sup>) The Soviet Union returned to the world market in 1972, when it sought unprecedented quantities of grain—especially U.S. grain—and eventually bought 22.8 million metric tons of it.<sup>19</sup>

The Soviet Union was one of the largest and most conspicuous buyers of U.S. grain, but its purchases were not the sole cause of the 1970s boom in the world grain market. Soviet grain imports accounted for about a third of the growth in the world grain trade during the 1970s, while imports by nonindustrial developing countries accounted for more than half. The members of the Organization of Petroleum Exporting Countries were among this group. These nations, flush with western currency from petroleum revenues, tripled their grain imports between 1970 and 1980.<sup>20</sup>

To exploit this expansion in trade, U.S. farmers increased production by planting



more acreage and using more fertilizers and pesticides. Acreage planted to corn increased from 67 million acres in 1970 to 84.6 million acres in 1976 and dropped only to 81.4 million acres in 1979. Fertilizer use rose 35 percent and pesticide use 80 percent during the decade. Yields jumped from 72 bushels an acre in 1970 to almost 110 bushels an acre in 1979. Total U.S. corn production rose from more than four billion bushels in 1970 to almost eight billion bushels in 1979.<sup>21</sup> Exports of U.S. corn, wheat and soybeans rose from more than 48 million tons in 1970 to 133 million tons in 1980.†

The growth in U.S. grain exports during the 1970s helped offset other trade problems caused by rising prices of imported oil and declining competitiveness of U.S. industrial products abroad.<sup>22</sup> However, the growing dependence of U.S. agriculture on exports exposed farmers to the vagaries of foreign policy, economics and trade. This new vulnerability to international matters complemented the high energy costs and interest rates that were driving up farm operating costs, and when the boom years of the 1970s gave way to the global recession of the 1980s, U.S. agriculture entered its worst crisis since the Great Depression. U.S. feedgrain exports fell off in absolute terms and as a percentage of world trade after January 1980, when President Carter put an embargo on U.S. grain sales to the Soviet Union in response to the Soviet invasion of Afghanistan. Major competitors in the world market, especially Canada and Argentina, expanded their production of wheat and feed grains and increased their sales in major markets that included the Soviet Union, the European Economic Community, Japan, Eastern Europe and China.<sup>23</sup> However, the U.S. embargo, which was lifted in April 1981, was not the only cause of the decline in U.S. grain exports during the 1980s. The strong U.S. dollar and high interest rates contributed to a three percent reduction in U.S. feedgrain exports in 1981.<sup>24</sup>

U.S. farmers were squeezed between record grain and declining markets the following year, when acreage planted to corn remained at levels equal to those of the late 1970s. Good weather produced a record corn harvest of more than 8.2 billion bushels, but export markets had deflated under pressure from worldwide recession and credit problems, high exchange rates for the dollar and high import levies in the EEC. U.S. corn exports in 1982 dropped 200 million bushels from 1981 levels. Grain carryover stocks were higher than they were in the early 1960s, corn prices fell and earnings on U.S. farms fell to their lowest since the 1930s.<sup>25</sup>

The 1983 Payment-In-Kind (PIK) program lopped 20 million acres from acreage planted to corn in 1982. The PIK program compensated farmers for idling cropland with payments from government surpluses set at 80 percent of normal yields on the idled cropland. (The exception to this figure were payments for idled wheat acreage, which were set at 95 percent.) Drought cut so deeply into production on the remaining 60 million acres that was planted to corn in 1983 that the harvest was the smallest since 1970 and barely half of what it was in 1982.

Production of corn, soybeans and wheat remained at high levels during the mid-1980s, but exports of the three commodities fell off. The peak calendar year for corn exports was 1980, for wheat it was 1981, and for soybeans it was 1982. After that, exports for all three commodities took a downward turn. The future of these exports is of critical importance to U.S. farmers. It may be equally important for the future of the Upper Mississippi River.

### *The Rising Stage of the River of Grain*

The value of the Upper Mississippi River as a commercial conduit soared as world demand for feedgrains and soybeans

† Growing demand for U.S. wheat and feedgrains boosted farm income during the 1970s, but it also set the stage for the farm crisis of the 1980s. A scramble for farmland pushed up land values, and many farmers who tried to increase production by buying more land had severe debt problems when record harvests, low prices, global recession and declining export markets simultaneously hit U.S. agriculture in the 1980s.

penetrated into the farmlands of the midwest United States. As U.S. exports swelled during the 1960s and exploded during the 1970s, grain accounted for an ever increasing proportion of tonnage shipped on the upper river. Growth in river shipments of corn, soybeans and wheat between 1960 and 1970 equals about 45 percent of the growth in total tonnage shipped on the river during the 1960s; growth in river shipments of the three commodities between 1970 and 1980 equals more than 90 percent of the increase in total tonnage shipped on the river during the 1970s.

During the 1920s, when lobbyists from the Twin Cities started their campaign for federal navigation projects between Minneapolis and St. Louis, the Upper Mississippi River was a river of sand, not grain. As much as 90 percent of the nominal shipments made on the river consisted of sand and gravel, possibly by the Corps of Engineers.<sup>26</sup> However, the lobbyists who promoted the federal barge service and nine-foot channel between the Twin Cities and St. Louis predicted that these subsidies to commercial navigation would prompt large shipments of agricultural products downstream. One Minneapolis lobbyist for the nine-foot channel project told a Senate hearing in 1930 that a deeper channel would provide "a more economical outlet for the export market and for the surplus of the northwest" and that the savings from grain exports would return directly to the region's farmers.<sup>27</sup> The Corps of Engineers preliminary survey of the Upper Mississippi River supported this argument by stating that the most economical commercial use of the river would be downstream carriage of

bulk commodities such as grain, and the Corps survey predicted lively commerce in grain shipments if the proposed river improvements were made.<sup>28</sup>† However, the transformation of the upper river into an avenue for grain exports did not interest major grain merchants at that time. During hearings on the nine-foot channel project that were hastily convened in April 1932, numerous grain merchants, elevator companies and flour mills sent a representative to Washington to argue against the project.

The federal barge line regularly carried grain during the 1930s but the size of its shipments follow no clear trend. The barge line's shipments of corn, for example, grew from about 1,300 tons in 1931 to about 24,000 tons in 1933 and then dropped to less than 400 tons in 1934. Even when the lock and dam system was completed in 1940, the river still was decades from becoming a conduit of corn, soybeans or wheat. Only five of the 53 terminals on the middle or upper river that were listed in a 1940 Corps report were major grain elevators, and only one of these, a public elevator in St. Paul, was north of St. Louis.††

Grain traffic on the upper river grew slowly during the 1940s and 1950s but seldom, if ever, accounted for more than 10 percent of total river commerce. That situation began to change in 1957 and 1958, when river shipments of grain increased to about 15 percent of total traffic. Within five years, they accounted for 30 percent of all commerce on the upper river; over the next 20 years, they would expand until they accounted for more than half of all tonnage on the river.

† The immediate benefits that farmers would have received from a nine-foot channel on the Upper Mississippi River probably would have been small, considering the importance of domestic markets for the hard spring wheat of Minnesota, the Dakotas and Montana, as well as the general complexities of the grain trade. Hard spring wheat was used mainly for domestic flour production, not for export. The general impact of the nine-foot channel might have been minor, because the world grain trade had become so complex by the 1920s that even the opening of the Panama Canal did not cause radical shifts in grain shipping (Federal Trade Commission, *Report . . . on Methods and Operations of Grain Exporters [Vol. II]: Speculation, Competition, and Prices* [Washington: GPO, 1923], p. 168; Joseph R. Hartley, *The Effects of the St. Lawrence Seaway on Grain Movements* [Bloomington, Ind.: Indiana University, 1957], p. 27).

†† The riverfront terminal was owned by the St. Paul Port Authority and operated by the Farmers Union Grain Terminal Association. The terminal had an elevator capacity of 22,000 bushels and connections to the 2.3-million-bushel Farmers Union elevator (U.S. War Department, Corps of Engineers, *The Middle and Upper Mississippi River: Ohio River to Minneapolis* [Washington: GPO, 1940], pp. 12-14).

As grain shipments increased, so did the pressure to expand the upper river's capacity for commercial navigation. During the 1960s, the Corps examined prospects for keeping the river open for traffic all year, for deepening the river's navigation channel another three feet, and for replacing one of the original lock and dam structures with a gigantic new structure that would have opened the upper river to even more barge traffic. The arguments behind these projects had more substance than the loud talk of the 1920s and 1930s: A real constituency had developed for commerce on the Upper Mississippi River by the 1960s, a constituency that included barge lines and grain merchants, and they were talking about real commerce, not just prospects for commerce. However, more had changed than just the emergence of a constituency that supported commercial navigation on the river. A constituency for the river's natural qualities had appeared as well, and environmental criticisms of navigation projects on the upper river were no longer voiced by just a few lonely legislators from northeast Iowa.

### **Plans for New Locks and Dams**

During the first two decades after World War II, the Corps of Engineers completed projects on the Upper Mississippi River that had been proposed or authorized in the 1930s but interrupted by the war.<sup>†</sup>

- In 1948, the Corps opened a new lock with standard 110-by-600-foot dimensions in the Hastings dam. The new lock complemented the original lock, which was 100 feet shorter than those in the other dams on the upper river.
- In May 1957, the Corps opened a 1,200-foot lock in the power dam at Keokuk to replace the short lock that was in use there since the dam was completed in 1913.

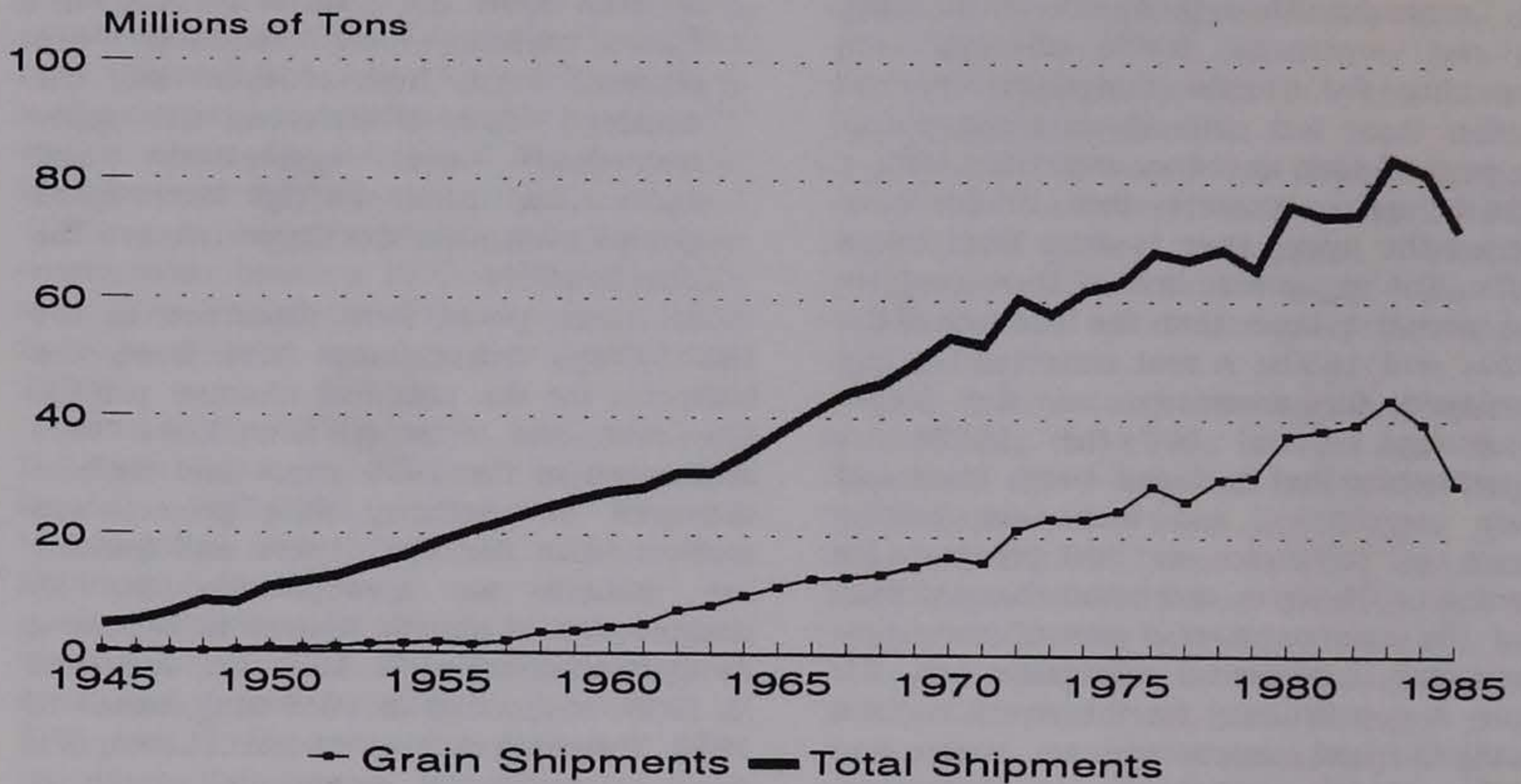
- In September 1963, the Corps completed a \$30 million dollar project in the Twin Cities to extend navigation five miles to an area above the Falls of St. Anthony. This project—which required two separate locks, both of them half the standard width of locks on the upper river—had been aggressively and successfully promoted by Minneapolis groups even after the Corps rejected the plan in 1936.

All three plans were discussed in the 1931 Corps survey that had been the blueprint for the nine-foot channel project. The first two sets of new locks were authorized in the 1935 rivers and harbors act; the St. Anthony falls project was authorized in the 1937 rivers and harbors act without an appropriation for its construction. A fourth project to bypass a navigation hazard at St. Louis was approved in 1939, authorized in 1945 and started in 1959. This project involved construction of a canal to bypass a seven-mile stretch of jagged rock ledges known as the "Chain of Rocks." (The "Chain of Rocks" stretched between St. Louis and the mouth of the Missouri River.) The canal and a 110-by-1,200-foot lock were opened in 1964 and designated Lock and Dam 27.<sup>29</sup>

Of the four construction projects, the new lock at Keokuk may have been the most important for navigation on the rising river of grain. The old lock measured 110-by-358 feet and may have restrained shipments of corn and other commodities from Iowa. The opening of the new 1,200-foot lock at Keokuk in spring 1957 appears to have had an immediate effect on grain shipments on the upper river. Downstream shipments of corn on the upper river jumped from 94,000 tons in 1956 to almost 284,000 tons in 1957, an increase that was not accompanied by a similar rise in corn traffic on the Illinois River, another major water route for corn. Downstream shipments of soybeans on the Upper Mississippi River also increased, rising

<sup>†</sup> As the federal government continued its work on aids to navigation, it also disposed of its own barge line. The federal government sold the barge line in 1953 to the Federal Waterways Corporation, a subsidiary of the St. Louis Shipbuilding and Steel Company (*Business Week*, 8 August 1953).

## Upper Mississippi Post-War Commerce Total Shipments and Grain Shipments



from about 200,000 tons in 1956 to more than 485,000 tons in 1957.

Shipments of corn, wheat and soybeans on the Upper Mississippi River had grown steadily in terms of tonnage since 1947. By 1958, they totalled almost 3.5 million tons and accounted for 14 percent of total commerce on the river. Over the next six years, grain shipments would swell to total almost 10 million tons and account for 30 percent of the traffic on the upper river. As this traffic increased, new schemes were hatched to expand navigation on the upper river.

The U.S. share of the world feedgrain export market was reaching 50 percent by the mid-1960s, and the Upper Mississippi River was carrying more and more of these feedgrains from the Corn Belt to the Gulf of Mexico. Beginning in the mid-1960s, politicians and lobbyists began to promote ways to cheat the weather and provide navigation all year. They also began to examine prospects for a navigation channel that was three feet deeper than the existing

channel which had been constructed at such tremendous cost.

Representative John R. Schmidhauser of Iowa helped organize a conference at Davenport, Iowa, in November 1965 that spurred the study of all-year navigation on the river. The Davenport meeting drew representatives from the Corps, the Coast Guard, the Maritime Administration and various shippers and merchants. Nicholas Johnson, Maritime Administrator of the U.S. Department of Commerce, told the conferees that the Midwest had economic trading prospects "that stagger the imagination" and that navigation on the Upper Mississippi River during all seasons was "the key that unlocks the door to international trade" for Midwest manufacturers and farmers.

"In order to compete on the world's markets, producers must have access to those markets all year; and I do not think that the growing industry of this area . . . should be shackled with a poor transportation system," Johnson said. "We at the Maritime Administration and in the American shipping industry stand ready in

whatever way we can to help the shippers in the area . . . . But as we push at the barriers to an expanding international trade for the growing Midwest, you must pull at those same barriers. Shippers must press the barge operators for year-round service, and both must press the Government to keep the upper reaches of the Mississippi as ice-free as possible during the winter months."<sup>30</sup>

In 1966, House and Senate public works committees passed two resolutions submitted by Iowa legislators to authorize Corps studies of all-year navigation on the Upper Mississippi River.<sup>†</sup> The Corps also received funds in 1966 to resume a study of a 12-foot navigation channel on the upper river, a study that was authorized in 1943 by the House Public Works Committee, initiated in 1944 and discontinued in 1952.<sup>31</sup> Neither of the Corps examinations yielded lasting navigation projects on the upper river, but debate over them brought out the commercial constituencies that had laid claim to the river.

During 1967, representatives of numerous businesses, commercial groups and government agencies provided oral and written comments, almost all of them supportive, on the Corps' studies of all-year navigation and a 12-foot channel. In its written statement, Bunge Corporation, one of the largest grain companies in the world, endorsed all-year navigation and said it would maintain and even expand "the competitive position of United States feedgrains and oilseeds in the large and potentially vast 'hard-money' markets abroad." Another major grain merchant, Cargill, Inc., was supportive but restrained in its written comments regarding the studies of year-round navigation and a 12-foot channel. The Illinois Grain Corporation endorsed all-year navigation and said the Upper Mississippi River "is too great a natural resource to be left unused part of the time." The Farmers Grain Dealers Association of Iowa endorsed the plan, as did a

representative of the Iowa Farm Bureau Federation.

The Iowa Agricultural Marketing Division, a division of Iowa's agriculture department, also backed the Corps studies. In addition, the Iowa agency provided the Corps with a report that described the importance of grain exports to Iowa's economy. The report, prepared by Iowa State University, detailed the tremendous growth in corn and soybean shipments from Iowa, especially barge shipments of the two commodities to Louisiana. From 1962 to 1965, the report said, overall shipments of corn from Iowa had risen 50 percent, and shipments of soybeans had risen more than 160 percent. Shipments of corn by barge had grown 190 percent, and shipments of soybeans by barge had grown 570 percent. The importance of Louisiana as the destination of these shipments was even more dramatic: barge shipments of corn to Louisiana had grown 300 percent, and barge shipments of soybeans to Louisiana had grown a whopping 646 percent.<sup>32</sup>

The Congressional resolutions for studies of all-year navigation prompted meetings and reports but no lasting policy. The Corps studied problems with winter navigation, such as ice-breaking and ice accumulations along the sides of towboats, barges and lock chambers, but concluded in 1973 that all-year navigation was feasible only as far north as Burlington, Iowa, and that navigation for 40 weeks a year would be feasible only as far north as Cassville, Wisconsin.<sup>33</sup> The Corps conducted more hearings in 1974 at Davenport, Iowa, and Quincy, Illinois, regarding all-year navigation but suspended work on the project during 1975 and 1976 due to a lack of funds. Money was allotted for more studies from 1977 to 1980, when the Corps concluded that "there currently exists a lack of public support" for extended navigation seasons on the Upper Mississippi River. The project died after the Corps' Rock Island office published a report

<sup>†</sup> The resolutions were submitted by Representative John Schmidhauser and Senator Jack Miller, and they were adopted 6 April 1966 by the Senate Committee on Public Works and 5 May 1966 by the House Committee on Public Works (Notice of Public Hearings, dated 3 May 1967, in *Report of Public Hearings* [U.S. Army Corps of Engineers, Rock Island District], pp. 1-2).

in November 1980 recommending that studies on all-year navigation be terminated.<sup>34</sup>

Examinations regarding a deeper channel on the Upper Mississippi River were part of a much broader debate during the 1970s over the future of the river as both a navigation corridor and as a natural environment. Studies of a 12-foot channel gained momentum after a March 1968 meeting at the Corps' district office in Rock Island, and Corps officials appeared more enthusiastic about prospects for a deeper channel than they had been four decades earlier when the nine-foot channel was proposed. A 1970 report from the Corps stated that an increase in depth from nine feet to 12 feet is "recognized as a distinct need," and the report discussed the establishment of a 12-foot channel by 1980 and a 15-foot channel by the year 2020.<sup>35</sup> Environmental groups were less keen on the project, though. A 12-foot channel on the river above St. Louis would require higher water levels, deeper dredging or some combination of the two. Environmentalists were critical of either action because higher water levels could flood wildlife habitats and deeper dredging could drain wetlands.<sup>36</sup>

The Corps study of the deeper channel on the Upper Mississippi River prompted less controversy than the Corps' apparent attempt to initiate the project with construction of a new dam with larger and deeper locks at Alton, Illinois. Debate over this project involved a volatile mix of legislation from the conservation movement era—the time of "efficient use" of natural resources—and laws enacted during the environmental movement of the 1960s. The controversy came to a boil when Congress debated financing of the project, an issue that hearkened back more than a century to days when "internal improvements" were a bone of contention in Congress.

### ***Controversy at the Confluence: The Fight Over Locks and Dam 26***

The controversy began in 1964, when the district engineer at the St. Louis Corps office

recommended replacing the locks at Locks and Dam 26 at Alton. The structure was completed in 1938 and was one of the last built during the 1930s to establish the nine-foot channel. Corps officials publicly claimed that the structure was deteriorating and that the existing capacity of the locks was inadequate, given the growing amount of river traffic and the location of the locks at a critical site just below the confluence of the Illinois and Mississippi rivers. In 1968, the St. Louis district engineer submitted a report to the Board of Engineers for Rivers and Harbors that recommended replacement of Locks and Dam 26 with a new dam and twin locks 110 feet wide, 1,200 feet long and 18 feet deep at the sill, the concrete ledge towboats pass over as they enter the lock chamber. The Board of Engineers approved the construction proposal in March 1969 and the Secretary of the Army approved the project in July 1969. Congress approved funds for planning in 1970 and appropriated \$22 million for construction of the new locks and dam in August 1974.<sup>37</sup>

The Corps pursued the project under the assumed jurisdiction of the 1909 rivers and harbors act, which stated that the Corps could rebuild entire navigation works when such reconstruction was "absolutely essential" to the maintenance of "existing navigation."<sup>38</sup> The Corps' action was challenged in federal court on both the authority of the 1909 law and laws that were the products of much different times and circumstances.

The 1960s were years of intense social upheaval, and environmental issues such as pollution and preservation of wilderness were among the many elements of this unrest. During the decade, ecology became a household word and environmental protection became a Congressional mandate. Federal legislation during the decade included the Wilderness Act of 1964, the National Wild and Scenic Rivers Act of 1968 and the National Environmental Policy Act of 1969, which is sometimes considered a capstone to this era of environmental lawmaking. Although the act, known by its acronym NEPA, aroused little attention when it went through Congress, its provisions have profoundly shaped government actions that

affect the natural environment. In some respects, the law came of age in the midst of litigation over the new lock and dam at Alton, Illinois.<sup>39</sup>

NEPA ordered all federal agencies to include detailed statements on "the environmental impact of the proposed action" whenever an agency proposed legislation that would have significant effects on the environment.<sup>40</sup> Environmental impact statements have been key issues in litigation over countless projects since the act was passed, and in 1974 they were critical in a move to stop the construction of the new locks and dam at Alton. The Izaak Walton League and the Sierra Club filed a suit in early August 1974 seeking an injunction against the lock and dam project on grounds that it would cause environmental damage and that the Corps of Engineers had not submitted a complete statement on the project's environmental impact.

The Corps had submitted an environmental impact statement earlier in 1974, but the plaintiffs argued that the Corps addressed only immediate local effects of the Alton project and ignored *future* repercussions of the project on the entire Upper Mississippi River and on the Illinois River. The plaintiffs also argued that the Corps proposal would increase traffic on the Upper Mississippi River so much that it constituted an entirely new project, not just the replacement of an existing structure. Construction of the new locks and dam at Alton, they said, was the first turn in the "ratcheting" of the entire nine-foot channel toward a 12-foot depth. A new project, the plaintiffs argued, required specific Congressional authorization, not just Congressional appropriations. In addition, the plaintiffs argued that the Corps had failed to consider alternatives to the reconstruction of the locks and dam at Alton.

The Corps' proposal and its potential to increase barge traffic on the Upper Mississippi River worried railroad executives as much as it worried environmental

activists. The early 1970s were a bad period for U.S. railroads: They were receiving low returns on their investment and their capacity had been strained by the rush to carry Soviet grain purchases to ports in 1972 and 1973. One explanation of the railroads' problems is that they were overbuilt in relation to the nation's entire transportation network. Railroad lines had been established during years when they were the major avenues of inland transportation, but government subsidies of waterways and highways, including the Interstate system, had helped truck and barge traffic cut into rail traffic, and federal regulations limited the railroads' freedom to drop unprofitable branch lines. Some railroads had introduced huge, covered hopper cars to attract long-distance grain shipments and were able to cut costs as a result, but these cars did nothing to make branch lines more profitable because the branches could not handle the 100-ton loads of the jumbo cars.<sup>41</sup>

Railroad companies charged that the Alton project would inflict economic damage as well as environmental damage, and 21 lines joined the environmental groups in the plea for an injunction against work on the navigation structure. The separate protests of the environmental and railroad groups were combined into one case that was argued in U.S. District Court in Washington, D.C.

District Judge Charles R. Richey agreed with the plaintiffs that the Corps both overstepped its authority and failed to comply with NEPA in its plans to build the new locks and dam at Alton. On 6 September 1974, Richey issued an injunction against work on the project.<sup>42</sup> In his decision, Richey wrote that the Corps had failed to get Congressional authorization for the project, that it had failed to comply with NEPA in considering the system-wide impacts of the new locks and dam, and that it had failed to adequately consider alternatives to the project.† In addition, Richey agreed that the Corps appeared to have designed the new

† Judge Richey wrote: "The only references in the EIS (environmental impact statement) to the possibility of other modes of transportation meeting the expected increase in traffic of goods are the conclusory statements that: railroads and other forms of transportation could not handle the increase in traffic of goods, especially grain."

locks in order to accommodate a 12-foot channel.

The Corps had officially dropped the 12-foot navigation study on the Upper Mississippi River in 1973.<sup>43</sup> However, the plaintiffs argued that material in the Corps' design memorandums clearly indicated that lock chambers in the new dam were designed to accommodate barges loaded to a 12-foot draft. Judge Richey agreed that the design of the new locks were "amenable" to passage of barges loaded to a 12-foot draft.

After reviewing evidence presented during the injunction hearings, Judge Richey also agreed that the Corps appeared to be planning for a deeper channel on the Upper Mississippi River without Congressional authorization for such a project. Richey pointed to a draft version of the environmental impact statement on the project in which the Corps said the replacement structure would "create impetus to revise other portions of the system to create the most efficient utilization of the added capacity of Locks and Dam No. 26."<sup>44</sup> In light of this and other evidence from Corps documents, Richey wrote, the Corps' contentions that it had rejected the 12-foot channel and was not considering increased river traffic were "unworthy of belief."<sup>45</sup>

Richey granted an injunction against continuing work on the lock and dam replacement until the Corps produced a more comprehensive environmental impact statement and obtained Congressional authorization for the project. The Corps began this process and, in August 1975, submitted its material to the Board of Engineers for Rivers and Harbors for recommendations.

For four years after the federal injunction was issued, the proposed locks and dam at Alton were the subject of national controversy. Legislators from Minnesota supported the project, just as they had supported the original lock and dam system in the 1930s, but the major backing in Congress for the Alton project came from Illinois and Iowa, the two major corn-producing states. Representative Paul Findley of Illinois, whose district included Alton, lost no time in trying to reaffirm Congressional support for the project after the federal injunction was issued. However, Findley's bill, introduced on 9 October 1974, died in a House public works committee. In January 1975, Representative Melvin Price of Illinois introduced a lock construction bill but it died in committee, as did another bill Representative Findley introduced in late February. An attempt in May to reaffirm Congressional support for the project also failed.<sup>46</sup>

The legal and political pressure on the Alton project increased during 1976. In February 1976, the Board of Engineers recommended construction of a new dam with a single lock 110 feet wide and 1,200 feet long.† (Although the board maintained that dual locks were economically justified and needed to "accommodate future growth of waterway commerce," the board recommended immediate construction of only one.) Following the board's recommendation, at least nine bills were introduced in Congress to deal with the project.

Senator Gaylord Nelson of Wisconsin, a harsh critic of the project, introduced one of the first bills on 13 May 1976. Nelson's bill

would require greater public investment, would cost more to shippers, would, by stifling industrial growth, have an adverse economic and social effect on the region, and would require greater energy consumption in light of the projected availability of fuels.

"While this Court is not in a position to agree with or dispute the merits of these conclusions, neither is the Congress nor the public since the data on which they were based and the agency's reasoning process were not included in the EIS. This is contrary to the policy of NEPA, which has been called an 'environmental full disclosure law.'" (382 F. Supp. at 623)

† The board assumed other locks on the Upper Mississippi River would not be enlarged when it reported on long-range effects of the new Alton lock and dam on the upper river's tonnage capacity. However, the board's report added "that a decision to replace Locks and Dam 26 with a structure of greater capacity will probably enable existing Upper Mississippi River locks to eventually reach their full capacity, thereby possibly creating a demand for enlargement of those locks at some future date" (*Report of the Board of Engineers for Rivers and Harbors: Locks and Dam 26* [February 1976], p. 79).



would suspend construction of the lock and dam until two major studies of the Upper Mississippi River were completed. Nelson's bill would have the Interior Department examine long-range impacts of the lock and dam system on the fish and wildlife of the Upper Mississippi and Illinois rivers and the Transportation Department conduct a comprehensive study of the Alton project in the context of national transportation policy. The bill was reported to the full Senate in September but no action was taken on it.<sup>47</sup>

Two weeks after Nelson introduced his proposal, Minnesota Senators Walter Mondale and Hubert Humphrey introduced a compromise bill that authorized the new dam and one 1,200-foot lock and also faced the environmental issues related to the project. The bill would require the Corps to replace terrestrial habitat that would be flooded by the project, revoked authorization for studies of deeper navigation channels on the Upper Mississippi River or its tributaries, and authorized compilation of a master plan for the management of the upper river by the Upper Mississippi River Basin Commission.†

A third Senate bill, introduced in May by Senator Adlai E. Stevenson of Illinois, carried no provisions other than authorization of a new dam and lock at Alton.<sup>48</sup> Between June and September, six other bills dealing with the project were introduced in the House, three of them introduced by Findley of Illinois, two by Neal Smith of Iowa, and one by Leonor Sullivan of Missouri. All the bills authorized the construction project. With the exception of Sullivan's proposal, they also addressed the opposition to a deeper channel on the Upper Mississippi with provisions to "revoke the existing authority for 12-foot channel studies."<sup>49</sup>

Both supporters and detractors of the lock and dam project had ample opportunity during 1976 to comment on the proposal. The Corps of Engineers solicited comments on its environmental impact statement, and the Senate subcommittee on water resources heard testimony during June and July on

the three Senate bills that dealt with the Alton project. In written comments to the Corps, supporters of the replacement locks and dam focussed on complaints of congestion at Alton and the importance of the structure to the nation's inland water traffic. Opponents tended to criticize the nature of the environmental impact statement itself.

The U.S. Maritime Administration backed the project and its prompt construction. "No one benefits from the current delay in moving forward with this important project," an administration official commented.<sup>50</sup> Secretary of Agriculture Earl Butz supported the Corps plan to replace the existing navigation structure at Alton because of its "low capacity in relation to future demand ... The constriction the low capacity of Locks and Dam 26 places on the flow of commodities on the inland water system is a serious concern to agriculture." The Corps' proposed replacement was necessary, Butz said, because barge transportation was "vital" to both shipments of agricultural commodities from the Upper Mississippi region to the south and to the return shipment of fertilizer and fuel.<sup>51</sup>

The Corps' impact statement came under severe criticism from public and private environmental bodies. The Sierra Club called the Corps impact statement a "strategic document" prepared by lawyers who were trying to defend a client rather than by officials who were interested in a "sound policy for the future of the Mississippi River." The Sierra Club's Midwest representative said the impact statement "completely fails to address the substantive environmental questions that we have raised in relation to this project."<sup>52</sup> Similar criticisms came from state and federal government agencies. The commissioner of the Minnesota Department of Natural Resources said the impact statement did not contain "satisfactory answers to the legitimate questions which have been raised by various court opponents of the Corps of Engineers." In addition, the

† The Water Resources Act of 1965 allowed the creation of regional planning agencies known as river basin commissions. President Nixon ordered formation of the Upper Mississippi River Basin Commission in 1972 at the request of the governors of Illinois, Iowa, Minnesota, Missouri and Wisconsin.

commissioner wrote, the Minnesota DNR was not convinced that the Alton project "would have as insignificant an impact on the Upper Mississippi River as Corps documents would suggest."<sup>53</sup> The director of the Wisconsin Department of Natural Resources said the Corps environmental impact statement failed to include an analysis of the project's impact on the entire Upper Mississippi River system and that the report was filled with broad statements "which are not backed up by factual information."<sup>54</sup> Regional administrators of the Environmental Protection Agency repeated these comments and called the impact statement "totally inadequate." The Corps document, they wrote, did not adequately assess the repercussions of the proposed project and did not evaluate "reasonable project alternatives."<sup>55</sup> Economists attacked the Corps' estimates of problems with the existing structure and the benefits to be derived from the new lock and dam. One economist from Pennsylvania State University said the Corps' economic analysis was based on data that was "erroneous and biased" and went on to state that benefits of the project were likely to be "negligible, if not non-existent." A University of Wisconsin economist said the Corps' projection of congestion and delays at Alton, one of the key complaints about the existing structure, was "absurd."<sup>56</sup>

Commercial interests—the railroads, barge companies, and agricultural businesses and organizations—refrained from comment on the Corps' environmental impact statement. They were out in force during the Senate hearings on the Alton project, though, and they deluged the Senate committee with oral testimony and written statements. The prominence of the barge industry during these hearings was especially notable, given its virtual absence from hearings four decades earlier regarding Mississippi River navigation. In the mid-1970s, the industry was thriving amidst a booming grain trade as well as federal

subsidies for barge construction through guaranteed loans and tax advantages. (The subsidies were enacted in 1970 as an amendment to the Merchant Marine Act of 1936.)

The Senate ended its hearings in late July 1976, the Corps sent its environmental impact statement to Congress in late August, and the Alton project came before the Congress in September as part of the Water Resources Development Act of 1976. The Senate Committee on Environment and Public Works included the project in section four of the proposed act and recommended authorization of a new structure at Alton with one 1,200-foot lock and provisions for addition of a second lock. The authorization included a ban on deeper channel studies and provisions for a comprehensive master plan for the management of the Upper Mississippi River system.<sup>57</sup> The water resources bill also contained a controversial provision that would gradually establish charges for users of the nation's inland waterways in order to recover half of the cost of their operation and maintenance and half the cost of building new navigation projects. Supporters of the Alton project tended to oppose user charges, while opponents of the Alton project tended to line up behind the proposal. The result was a controversy that threatened to block passage of the act during the session.

Gaylord Nelson, a strong critic of the Corps proposal for Locks and Dam 26, threatened to filibuster if the water resources bill moved forward with the Alton project in it. Nelson said he opposed the authorization because it was being debated before other government studies by the project were completed.

"I, of course, am not opposed to Locks and Dam 26," Nelson said. "Wisconsin is one of the states that is bordered by the Mississippi River. The only issue in dispute is what is the best response to the current situation."†

† The bill, Nelson said, was "a build-now-study-later approach" that Congress should reject. He pointed to the EPA's characterization of the Corps' impact statement as inadequate and countered arguments that the existing structure was unsound by citing the Corps' own inspection reports of the facility.

Backers of the project, such as Senator Thomas Eagleton of Missouri, reluctantly agreed to an amendment to drop both the Alton project and the user charges provisions in order to get the rest of the act approved in the current session.

"Frankly, I do not much like this amendment, but it is about all we can do at this time," Eagleton said. "The senator from Wisconsin has the word 'fillbuster' written all over his face."<sup>58</sup>

The Senate voted to drop both the Alton project and the user fee provision with the understanding that both proposals would be reconsidered early in the next session of Congress. They were.

During 1977, the Alton project was the subject of two bills introduced in the Senate and ten bills introduced in the House.<sup>59</sup> The proposal that would ultimately carry the Alton lock and dam project into law was introduced on 24 February 1977 by Senator Pete Domenici of New Mexico.

Domenici had the least seniority of any of the 12 newly-elected Senators sworn to office in January 1973. As a consequence, Domenici was last in line when Senators picked their committee assignments. By chance, the Senator from one of the nation's driest states ended up on the Senate Subcommittee on Water Resources and heard testimony on Locks and Dam 26 during the summer of 1976. As the testimony dragged on, Domenici began to probe barge industry representatives about having them finance navigation projects instead of the federal government. On the last day of the hearings, Domenici's questions infuriated a barge line executive in the audience.

"How come you're so interested?" the man shouted from his seat. "You don't have any waterways in New Mexico. What business is it of yours?"

Domenici, angered by this response, introduced a user-charge bill at the opening of the 95th session of Congress that would assess the barge industry for the cost of federal construction and maintenance of

navigation projects such as Locks and Dam 26.<sup>60</sup> User charges had been introduced in Congress since the 1930s and had been part of the 1976 water bill, but the 1976 provision and those before it died under pressure from water freight lobbyists. Domenici, however, tied user fees to an authorization for Locks and Dam 26, a proposal that was almost guaranteed to weather a legislative storm because it was something the barge industry wanted very badly.

Domenici's bill, as it was reported from the Senate environment committee in May 1977, resembled sections of the 1976 water bill; it was a hybrid that contained provisions for user charges, a new lock and dam, and a major study of the Upper Mississippi River system. Domenici's bill authorized the Secretary of Transportation to investigate user charges, such as lockage or license fees, that would eventually recover all of federal operation and maintenance costs for inland navigation projects and half of the costs of new construction. In addition, the bill authorized construction of a new dam and one 1,200-foot lock at Alton at an estimated cost of \$421 million, and it established an Upper Mississippi River System Council to compile a master plan on management of the river, a concept embodied in the bills Senators Nelson and Mondale introduced in May 1976.<sup>61</sup>

Of the twelve bills introduced in 1977 that dealt with the Alton lock and dam project, Domenici's plan made the most progress through Congress. Much of the bill's advance was due to the election of President Jimmy Carter. Carter, the Democrat, and Domenici, the Republican, had a common interest in getting user charges approved by Congress. Carter had grown suspicious of the Corps of Engineers during his tenure as governor of Georgia, when he was involved in a fight that blocked a Corps proposal to dam one of the state's scenic rivers. Carter also brought into office with him a Secretary of Transportation, Brock Adams, who publicly supported the idea of waterway charges.<sup>62</sup> With the

<sup>58</sup>"The Congress should face this problem for what it is, a ludicrous, unsupported engineering scheme being sponsored by an immensely powerful bureaucracy" (*Congressional Record*, Vol. 122, pt. 25, pp. 32886-32893).

President's support, Domenici's bill cleared the Senate on 22 June 1977. The bill stalled during the 1977 Congressional session, though, due to conflicts between Domenici and Senator Russell Long of Louisiana, an opponent of user charges, and to a Constitutional requirement that the House, not the Senate, must initiate all bills that raise revenue.

The passage of the lock and dam authorization and user charges through Congress during 1978 was tortured. Domenici's original bill was watered down and burdened with about \$2.5 billion in water project authorizations. The House then began to compile a \$2 billion list of water projects in preparation for a conference with the Senate on the bill. Neither of these bloated proposals progressed after Carter threatened to veto both of them and as the end of the session approached.<sup>63</sup>

The bill that finally authorized both the Alton project and user charges came out of Senator Long's office in October, less than two weeks before Congress was scheduled to adjourn. Long had grown angry with barge industry lobbyists for their intransigence on the user charge issue and had gained respect for Domenici's political skill. With the session drawing to a close, Long decided to help Domenici put the user charge proposal and the Alton project authorization into law. Long was the chairman of the Senate finance committee which handled tax law revisions that began in the House, and he frequently used revisions of obscure tax laws as vehicles to pass last-minute legislation. He pulled one such bill, a revision of tax laws as they pertained to bingo, for this purpose in October 1978.<sup>64</sup>

The bill provided that income from bingo games conducted by tax-exempt organizations would not be taxed if the organizations used paid labor. When Long introduced the bill in the Senate on 10 October 1978, it had been amended to contain provisions for construction of a new dam and a 1,200-foot lock at Alton; a prohibition on 12-foot channel studies on the Mississippi River above Cairo, Illinois; the imposition of taxes on fuel used in

commercial transportation on inland waterways; the establishment of an Inland Waterways Trust Fund to receive fuel tax revenues and disburse them for construction and maintenance of navigation projects; and a mandate for the Upper Mississippi River Basin Commission to prepare a comprehensive master plan for the management of the Upper Mississippi River system. In its authorization of the Alton project, the act provided that the new structure be designed "to provide for possible future expansion," a provision that addressed the demand for a second lock at a future date.

The compromise satisfied most members of the Senate. Nelson, who had opposed previous attempts to authorize the Alton project, cosponsored the amended bingo bill and endorsed the compromise. Wisconsin's other Senator, William Proxmire, was one of the few who criticized the bill.

"I do want to record my opposition both to reconstruction of Locks and Dam 26 and to the weakened user fees provided in the compromise before the Senate today," Proxmire said. "We may be hoping to buy improved transportation on the Mississippi, but we are selling the taxpayers down the river." Proxmire reluctantly accepted the amended bill.<sup>65</sup>

The Senate passed the bill and sent it to the House where it came up for debate on 13 October. However, the bill's original provisions relating to bingo had been deleted unintentionally, a mistake that did not escape notice on the House floor.

"By mistake, the bingo bill lies slain on the floor of the Senate," remarked Representative Bill Frenzel of Minnesota. "Sometime in the next 24 or 48 hours I would hope that the bingo bill would reappear, and I hope the Members of the House will be gracious and allow us to go forward with the bill."

That day, the House passed the amended bill and also approved a concurrent resolution that returned the bingo bill's provisions to the bill. The resolution received unanimous consent in the Senate and the original bingo provisions were tacked onto the end of the bill.<sup>66</sup>

## Passing the Crest

The controversy over the Alton project did not end when Jimmy Carter signed the act into law on 21 October 1978. The coalition of environmental groups and railroads that obtained the 1974 injunction from Judge Richey went before Richey again during a five-day trial in September 1979. Their suit questioned the Corps' compliance with NEPA and charged that its environmental impact statement was defective.<sup>67</sup>

Representatives of commercial navigation companies scoffed at the continuing environmental dispute. "You'd think we were doing something immoral or obscene down there," said John Lambert, president of Twin Cities Barge and Towing Co. "The river was not designed as a national park to which transportation has encroached. Transportation was the primary exercise. Lock 26 is not an environmental issue. It never was. It is an economic issue."<sup>68</sup>

Richey refused to grant another injunction. In his decision on 23 October 1979, Richey ruled that the Corps had included "adequate environmental data" in its impact statement and that Congress, in approving the Alton project, had determined that the lock and dam was in the public interest. (Richey's decision was upheld on 27 April 1981 by the U.S. Court of Appeals in Washington, D.C.)<sup>69</sup>

Richey's decision gave a green light to the new lock and dam and work began on 25 April 1980. After 90 minutes of speeches and an explosion of fireworks, workers on a barge moored in the middle of the Upper Mississippi River began to pound the first of 10,000 steel pilings into the river bed for construction of the \$420 million project.<sup>70</sup>

Even this huge new structure could not guarantee the financial health of the barge industry, though. As construction began, traffic on the Upper Mississippi River began to waver. The total tonnage on the river above St. Louis during 1981 and 1982 was two million tons lower than it had been in 1980. Traffic on the upper river rose 10 million tons in 1983—reflecting a

four-million ton increase in shipments of corn, soybeans and wheat—but it dropped in 1984 and plummeted in 1985. The commerce of the Upper Mississippi River was beginning to reflect the impact of the global economic recession and changes in world markets for grain. In addition, the navigation industry was suffering from a glut of barges.

In response to orders from towing company and private investors, barges had been built at a rate of 1,000 a year in 1979 and at 1,500 to 2,000 a year during 1981 and 1982. Towing companies placed orders with the expectation that the grain trade would expand for another five years, but they had been joined by private investors who were "playing around" with barge purchases as tax shelters. The result was a glut of barges, and the combination of slumping trade and barge surpluses spelled financial disaster, barge line officials said. Even though river shipments on the Upper Mississippi River peaked at more than 84 million tons in 1983, the river of grain had become a river of red ink, a transformation that was not quick to reverse itself.

"We thought we hit bottom last year," a St. Louis barge line official said in June 1985. "Well, this year is worse."<sup>71</sup>

Despite the slump in the barge industry and changes in the world grain trade, the momentum that had built up behind navigation projects on the Upper Mississippi River did not show signs of slowing. In the mid-1980s, the Corps' district offices along the Upper Mississippi River began to publish reports on the costly refurbishing of the locks and dams between Minneapolis and St. Louis as the structures enter their sixth decade of service. One of these projects, the rehabilitation of Lock and Dam 20 near Canton, Missouri, was estimated to cost \$20 million alone. And, in November 1986, almost six decades after the initial lobbying began for the construction of the lock and dam system, Congress approved construction of a second lock at Alton at a cost of \$220 million, tens of millions of dollars more than the 1940 pricetag of the original system.<sup>72</sup>

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# EPILOGUE

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**P**roponents of the new lock and dam at Alton and opponents of user fees buoyed their arguments with the same logic that floated the nine-foot channel scheme through Congress in 1930. Waterborne commerce, they said, was vital to the economic vitality of the upper Midwest and to relief from railroad freight rates. During the 1976 debate over the water resources bill, for example, Senator James Allen of Alabama claimed that railroads reduced rates on farm goods, fertilizer, and coal during the 1960s to enter markets that had been opened by water transportation. Allen said any increase in the cost of water transportation would weaken this lever on rail rates. The loss, he added, would reverberate through the agriculture and industry of the upper Midwest, and "the entire regional economy would sag."<sup>1</sup>

Claims that commerce on the Upper Mississippi River is essential to the regional economy are easy to make during prosperous times, but they are hard to believe when the economy goes sour. Navigation on the river saved neither the industry nor the agriculture of the upper Midwest from the pain of global recession during the 1980s. Millions of workers and farmers were out of jobs or off their land after the nation's industry faltered and international grain markets collapsed. Even the barge industry, the beneficiary of tax subsidies for vessel construction and multi-million dollar navigation projects, floundered amidst the

economic misery of those years. Commercial navigation on the Upper Mississippi River deserves greater scrutiny, for its promise may not be as great as its proponents claim and its problems may be worse than are commonly acknowledged.

Commercial navigation on the nation's rivers, including the Upper Mississippi River, has been promoted since the end of the Civil War as a both a cheap form of transportation and as a balance against railroad rate increases. The Senate report issued by the Windom committee made this claim in 1874 and the Senator from Alabama repeated it in 1976. However, those who promote the alleged cheapness of barge transportation do not always discuss the federal subsidy it requires—the costs the public pays through government expenditures for the construction, operation and maintenance of inland waterways.

Much of the debate between railroads and the water freight industry revolves around the equity of federal subsidies to these two modes of transportation. Modern subsidies to water commerce often are compared to the massive land grants that state and federal governments made to railroads in the nineteenth century, grants that helped establish the nation's railroad network and continue to benefit some railroad companies today. However, a thorough critique of federal support to railroads and barge lines would require more than a tally of subsidies to each form of

transportation; it would require a look at circumstances surrounding these subsidies. Land grants to railroads may not have been made simply as a national policy to promote a specific form of transportation; they may have been made to benefit specific elements of U.S. industry that required railroads for commercial success. Owners of flour mills, for example, filled the boardrooms of some Midwest railroads during the late 1800s, and land grants to their lines might be seen as subsidies to their main enterprise first and part of national transportation policy second. Likewise, the circumstances surrounding federal support for inland navigation projects should be examined to determine their value to specific economic or regional interests, for these federal subsidies resemble national policy only when they are compressed into lists of Congressional authorizations and appropriations. For example, the extension of federal barge service to the Twin Cities and the establishment of the nine-foot channel offer greater testimony to the tenacity of a select group of attorneys and business executives than to the initiatives of Congress. The appearance of national policy in regard to these two developments comes by default, not by design.

Federal support of navigation projects involves more than lobbying and authorization from Congress, though; it also requires the U.S. Army Corps of Engineers to carry out these projects. The Corps' critics sometimes claim the agency perpetuates its own existence by developing constituencies for projects and then promoting these projects in Congress. An examination of the lobbying behind the nine-foot channel project weakens this criticism, at least in its application to Corps activities in the 1920s. During the debate over the nine-foot channel, Corps officials were reluctant to support the project and at least one opposed it outright. Only when the Roosevelt administration publicly supported the lock and dam system did the Corps put its full weight behind this project. The reluctance of Corps officials to support the navigation scheme is not easily explained, but it may be tied to notions of professionalism within this bureaucracy. The Twin Cities lobbyists who promoted the nine-foot channel often were

arrogant, and their expectations of government offices knew no limits. Their attitudes may have prompted resistance to the project within the Corps by threatening to smear the agency with the taint of working for a commercial clique. Since World War II, though, the Corps has appeared less hesitant to promote and prosecute work on the Upper Mississippi River, perhaps because the emergence of a water freight industry that exploits the channel allows the appearance of working *with* a commercial interest, not working as its construction auxiliary.

The bureaucratic momentum that guides the Corps approach toward navigation on the Upper Mississippi River, whether it is professionalism or self-perpetuation, should not be examined in isolation. The lobbying that imposed the nine-foot channel on the Upper Mississippi River was prompted by decisions in the offices of railroad executives, Twin Cities entrepreneurs and Interstate Commerce Commission bureaucrats. Similarly, the perpetuation of the channel today involves developments in the byzantine world of international grain markets, and it should be evaluated in this context.

Grain may well be the driving force behind the growth of commerce on the upper river since World War II (see Appendix A). By the early 1980s, shipments of corn, soybeans and wheat accounted for half the total traffic on the upper river, and increases in river traffic show strong relationships to both increases in river shipments of grain and the expansion of foreign markets for U.S. grain. The primacy of grain raises many questions about the benefits of subsidies to navigation on the Upper Mississippi River. First of all, who benefits from downstream shipments of this grain? Supporters of commercial navigation frequently claim that lower costs of barge transportation directly benefit grain producers of the upper Midwest. This might be true if these producers delivered grain directly to riverfront terminals and handled their own arrangements for sale and shipment of their product. This claim appears simplistic, though, when it is examined in the broader context of the grain trade. Profits from the sale of grain depend on more than the difference between barge

rates and railroad rates between two points; they involve current market conditions or prospects for future markets, conditions at ports, and the expense of transporting grain from a farm or country elevator *all the way* to market, not just from a river town to New Orleans.

Grain merchants may stand to benefit more than producers from subsidies to navigation on the Upper Mississippi River, although these merchants may regard barge transportation as only one factor in a highly complex scheme of buying, shipping and selling grain. Freight rates, the availability of rail cars or barges, and congestion at ports are among the many factors that influence the handling of grain shipments. The value of a navigable channel on the Upper Mississippi River to grain merchants may lie in its availability as a transportation *option*, although the degree of any company's interest in river navigation also may depend on its investments in floating equipment and waterfront facilities.

Grain merchants rely heavily on terminals near New Orleans to transfer grain to ocean-going vessels. However, they do not depend exclusively on the Mississippi River to haul grain to the Gulf as evidenced by the development of unit-trains, large groupings of freight cars loaded with a single commodity, to haul grain from the Midwest to port. In this light, the most significant beneficiary of grain shipments on the Upper Mississippi River appears to be the water freight industry itself, for it has no options to haul by land; its investment is in floating equipment and when river shipments fall, its business sinks.

If grain is, in fact, the major determinant in the level of commerce on the Upper Mississippi River, it raises two other questions. One concerns the benefit to consumers of traffic in other cargoes, such as coal. The other regards the future of the grain trade itself.

Although grain has accounted for as much as half of all traffic on the upper river,

fluctuations in levels of grain shipments may account for more than half of the fluctuations in total traffic on the upper river. Barge lines may be reluctant to go downstream without a paying load of grain just to pick up a load of cargo to bring back upriver. If this is the case, it weakens the claims that the upper Midwest depends on river transportation for cargoes such as coal or fertilizer. Whatever benefits accrue to communities and states from upstream shipments of these commodities may be largely determined by international grain markets, and benefits to consumers may be inconsistent at best.†

Given the strong relationship between world grain markets and the rise in traffic on the Upper Mississippi River, the future of commerce on the upper river is likely to be strongly shaped by the future of the world grain trade. Foreign demand for U.S. grain deflated under the pressure of government policies in grain-producing countries and under the tremendous debts incurred by many Third World countries. These debts had financed some of their earlier purchases of grain. Demand for U.S. grain may return, but it is likely to be tempered by a wide range of factors. The ability of importing nations to increase their own grain production may be crucial in determining U.S. grain exports in the future as foreign governments subsidize domestic agricultural production and as they gain access to technology and information by way of multinational agribusinesses, international agricultural research centers, and students who obtain advanced degrees in agricultural disciplines from institutions in the United States and other developed nations.<sup>2</sup>

The perpetuation of the nine-foot navigation scheme on the Upper Mississippi River deserves to be evaluated in the light of these prospects for future U.S. grain exports: A century of manipulating the river to accommodate waterborne commerce has had serious effects on its natural character and

† Geographic benefits of river transportation deserve evaluation to determine the degree to which such benefits are restricted to certain areas, both in terms of distance from New Orleans and of distance inland from river terminals.

few, if any, of those effects have been positive.

The most diverse and productive wildlife habitats along the Upper Mississippi River are aquatic habitats along the border of the main channel and in its side channels and backwaters. These areas contain rich beds of vegetation and provide breeding, resting and feeding areas for fish and waterfowl.<sup>3</sup> These backwater habitats have been disappearing for decades as accumulations of sediment slowly but steadily fill them. Modifications to the river to aid navigation are commonly blamed for the loss of these backwaters because dams that funnel water toward a central channel also slow the current in the backwaters and allow sediment to settle out and accumulate there. The construction of the lock and dam system aggravated this backwater sedimentation by slowing the water flow in both the main channels and the backwaters.†

The problems caused by the disrupted flow of the river are complemented by increases in the river's sediment load and disturbances from motorized vessels. Conversion of floodplains and upland areas to agriculture has destroyed river wetlands and contributed to the erosion that is filling them with sediment.<sup>4</sup> Commercial navigation worsens the sedimentation by riling the riverbed. The passage of towboats and barges can raise more than a ton of sediment in a plume that can stretch two miles and smother bottom-dwelling creatures as it settles back to the riverbed. The suspended sediment can drift into backwaters and add to sediment accumulations, and turbid water

can cut off sunlight that aquatic plants need for photosynthesis.<sup>5</sup>

The Corps of Engineers, government biologists, and backers of the nine-foot channel have claimed that the creation of navigation pools actually increased habitat for fish and waterfowl. This may have been true at first, but sediment accumulations appear to be destroying this byproduct of the navigation scheme. In any case, the natural rise and fall of the river was not without benefit; these changes once rejuvenated backwater vegetation to the benefit of waterfowl.

The deformation of the Upper Mississippi River has been tempered since the 1960s by the emergence of strong environmental organizations and the integration of environmental protection into government laws and bureaucracies. These developments helped limit or end potentially harmful practices and proposals such as the disposal of dredge spoil in the river's wetlands and the apparent plan of the Corps of Engineers to initiate a deeper channel in the upper river. More recently, the 1986 water resources act authorized programs to improve fish and wildlife habitats on the upper river. If damage to the river can only be overcome by expensive mitigation, though, perhaps the benefits of the compromise between economics and ecology are small when compared to the fiscal and physical costs of the compromise.

Even as the future of commerce on the Upper Mississippi River wavers, commercial navigation between St. Louis and Minneapolis promises to continue consuming

† Wing dams reach from shore toward the river's center to funnel water to the central channel. In addition to their effects on backwaters, this manipulation of river current can reduce the diversity of aquatic habitats in the main channel.

Severe sedimentation on the Upper Mississippi River was noted by the scientists, public representatives and government personnel who compiled the environmental section of the 1982 master management plan for the Upper Mississippi River, a document that was ordered as part of the Congressional compromise regarding the new lock and dam at Alton. The environmental study team said navigation dams and river control structures "essentially stopped the processes which create and cleanse backwaters and side channels. By slowing flow and diverting water to the main channel they accelerated sedimentation in backwaters and side channels. . . . Since the 1930s the navigation pools, side channels and backwaters have experienced average sedimentation rates between 1/2 and 2 inches per year. At this rate substantial backwater areas will be eliminated within the next 50 years. Within a century most of the UMRS (Upper Mississippi River System) will consist of a main channel bordered by dry land or shallow marsh, and some running sloughs" (Comprehensive Master Plan for the Management of the Upper Mississippi River System: Technical Report D, Environmental Report [25 September 1981], p. XI-1).

hundreds of millions of dollars. Congress has authorized the expenditure of \$220 million on a second lock at Alton, and millions more may be spent on the rehabilitation of the structures that lie athwart the river. User fees that Congress approved in 1978 and increased in 1986 will recover some of the cost of the nine-foot navigation channel on the Upper Mississippi River, but the perpetuation of this project deserves scrutiny more severe than a simple tally of economic costs and benefits that pertain to navigation. The nine-foot channel is an artificial imposition on an extraordinary river. It is an imposition born of the parochial self-interest of a group of Twin Cities industrialists who are long dead, and its greatest exploitation occurred during an extraordinary explosion in the world grain trade that may have ended. Claims that navigation on the upper river bolsters the economic health of the upper Midwest should not be ignored, but they should be considered in the context of a much broader economic framework. Frederick Biermann, the Representative from Decorah, Iowa, who was one of the few to

oppose the nine-foot channel in 1933, made this point simply during House hearings on the proposal. He questioned whether the fortunes of industry or agriculture in different sections of the country rose or fell based on their access to water transportation.

"There are other things that enter into this business beside water transportation," Biermann said. "There are many factors that enter into our prosperity."

Indeed there are, and we should cherish the pulse of life through this great river valley as an element of our prosperity if we consider ourselves human beings and not just accountants. A time may come when these locks and dams, these artifacts to the business priorities of another time, should be dismantled and the great river allowed to follow its own course, when the metal gates of the dams should be removed and the concrete walls and monoliths allowed to crumble. Their decay might testify to our ability to recognize abuse of nature's abundance and our desire to heal wounds inflicted by our predecessors.

## EPILOGUE NOTES

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1. Cong. Rec., Vol. 122, pt. 25, p. 32880.
2. U.S. Congress, Office of Technology Assessment, *A Review of U.S. Competitiveness in Agricultural Trade—A Technical Memorandum* (Washington, D.C.: GPO, October 1986).
3. *Comprehensive Master Plan for the Management of the Upper Mississippi River System: Technical Report D, Environmental Report* (25 September 1981), p. VI-24.
4. *Technical Report D*, p. IV-2, 5, 7.
5. Testimony during September 1979 legal challenge to lock and dam 26 in 480 F. Supp. at 998; *Technical Report D*, p. VI-27.

# APPENDIX A

## *Statistical Analysis of Commerce on the Upper Mississippi River, 1922-1985*

The potential of the Upper Mississippi River to carry Midwest farm products to distant markets was promoted loud and long during the 1920s and 1930s. This potential was not soon realized, despite huge federal subsidies to encourage it. An extraordinary boom in world demand for feedstuffs during the 1960s and 1970s changed that situation completely. Shipments of three valuable agricultural commodities—corn, soybeans and wheat—began to account for a growing portion of commerce on the upper river until they eventually amounted to more than half of the upper river's annual traffic.†

Corn, soybeans and wheat first began to account for a larger portion of river cargoes in 1958, when shipments of the three commodities equalled 14 percent of all river traffic. During the next five years, shipments of these commodities increased until they accounted for 30 percent of total annual traffic on the upper river, and they retained that level of prominence for the rest of the 1960s. Between 1971 and 1973, shipments

of the three commodities increased even more. With the enormous sales of U.S. grain to the Soviet Union, shippers hurried to put feedgrains from U.S. storage bins onto the world's sea lanes, and shipments of corn, soybeans and wheat suddenly totalled 40 percent of river commerce. During the late 1970s and early 1980s, shipments of corn, soybeans and wheat assumed larger portions of total shipments on the upper river as foreign demand for U.S. feedstuffs swelled even more. By 1982, the three grains accounted for 53 percent of all shipments on the Upper Mississippi River. These three commodities not only accounted for much of total commerce on the upper river; they also were equal to a significant amount of the *growth* of total shipments during the 1960s and 1970s. Growth in shipments of corn, soybeans and wheat equalled about 48 percent of the growth in total annual commerce on the upper river between 1960 and 1970 and more than 90 percent of growth in total annual commerce between 1970 and 1980.

† Statistics for Upper Mississippi River commerce are published in annual reports by the Corps of Engineers. For most years, these statistics cover commerce between Minneapolis and the mouth of the Missouri River. However, statistics from 1928 through 1934 cover smaller portions of that stretch, possibly due to changes in jurisdiction between the Corps offices in St. Paul and Rock Island and to changes in authorizations for navigation projects on the river above St. Louis. Statistics for 1928 and 1929 cover the stretch between the mouths of the Wisconsin and Illinois rivers, and for 1930 to 1934 they cover the section between Minneapolis and the Illinois River. The full listing of data used for this statistical analysis, and the accompanying correlation tables, are in the author's master's thesis, filed under the title "A River of Grain" in the Memorial Library at the University of Wisconsin-Madison.

Since the federal government began its massive subsidies to navigation on the Upper Mississippi River, the river has become a trade avenue for commodities and materials that include foodstuffs, fuel, chemicals and minerals. Corn, soybeans and wheat dominate the river's commerce, though, and these shipments are, in turn, largely determined by foreign demand. The following statistical appendix will sketch a rough outline of this "river of grain" and foreign demand that feeds it.

### ***Growth of Total Commerce***

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Total commerce on the Upper Mississippi River during the 1920s and 1930s was small and unglamorous. Figures for total shipments were sometimes less than one percent of contemporary statistics. Between 1922 and 1934, commerce dropped as low as 692,000 tons (1926) and exceeded one million tons only in 1928, the first full year of federal barge service between St. Louis and the Twin Cities. During that period, shipments of sand and gravel (possibly shipments by the Corps of Engineers) accounted for 76 to 89 percent of all river tonnage. More valuable commodities, such as grain and coal, did not surpass sand and gravel as percentages of total traffic until the lock and dam system was finished in 1940.

Total tonnage shipped on the Upper Mississippi River began to grow steadily during the 1930s. Total annual shipments exceeded one million tons in 1934, two million tons in 1936 and three million tons in 1940. Grain accounted for less than five percent of this traffic until 1938, when it suddenly swelled to 16 percent of total commerce on the river. The sudden increase in grain shipments was largely due to a dramatic jump in corn shipments from 18,000 tons in 1937 to almost 367,000 tons in 1938. (A domestic bumper crop in 1937, coupled with a short corn crop that year in Argentina, boosted corn exports in 1938 and may be responsible for the sudden expansion in grain shipping on the upper river.)<sup>1</sup> Grain shipments declined to 12 percent of total river commerce in 1939.

Coal assumed larger portions of total river traffic in the 1940s until it accounted for 24 percent of total shipments in 1942. Coal accounted for 10 to 20 percent of river commerce between 1943 and the late 1970s, when it began to hover around 10 percent.

During World War II, total annual commerce on the upper river stayed between three and five million tons. Total annual commerce exceeded five million tons in 1946 and doubled by 1950 to reach 11 million tons. It more than doubled between 1950 and 1957, topping 22 million tons, and doubled again by 1968, when it reached 45 million tons. In the next 15 years, total annual commerce continued to grow until it peaked at more than 84 million tons in 1983.

The tremendous growth in river commerce between the end of World War II and the late 1950s does not appear linked to increases in shipments of corn, soybeans or wheat. The three commodities did not account for more than 10 percent of total commerce between 1946 and 1958. Grain shipments in 1958 were more than three million tons higher than they were in 1946, but total annual commerce had grown by more than 19 million tons during the same period. Shipments of corn, soybeans and wheat began to assume a larger portion of river commerce in 1958, though. Shipments of these three crops expanded from nine percent of total commerce in 1957 to 14 percent of total commerce in 1958. They doubled to account for 30 percent in 1964 and stayed at that level until 1972, when they started to reflect the boom in world grain exports and expanded until they were 53 percent of total river commerce in 1983.

### ***Growth of Corn, Soybean and Wheat Shipments***

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The growth of commerce on the Upper Mississippi River since the late 1950s parallels the growth of commerce in grain (see figure 1), and the increase in grain shipments in turn reflects the volatile nature of domestic production and foreign exports over the last three decades. This period seems to begin in 1958, a period during



Upper Mississippi River Commerce  
 Figure 1: Total Shipments and Grain Shipments

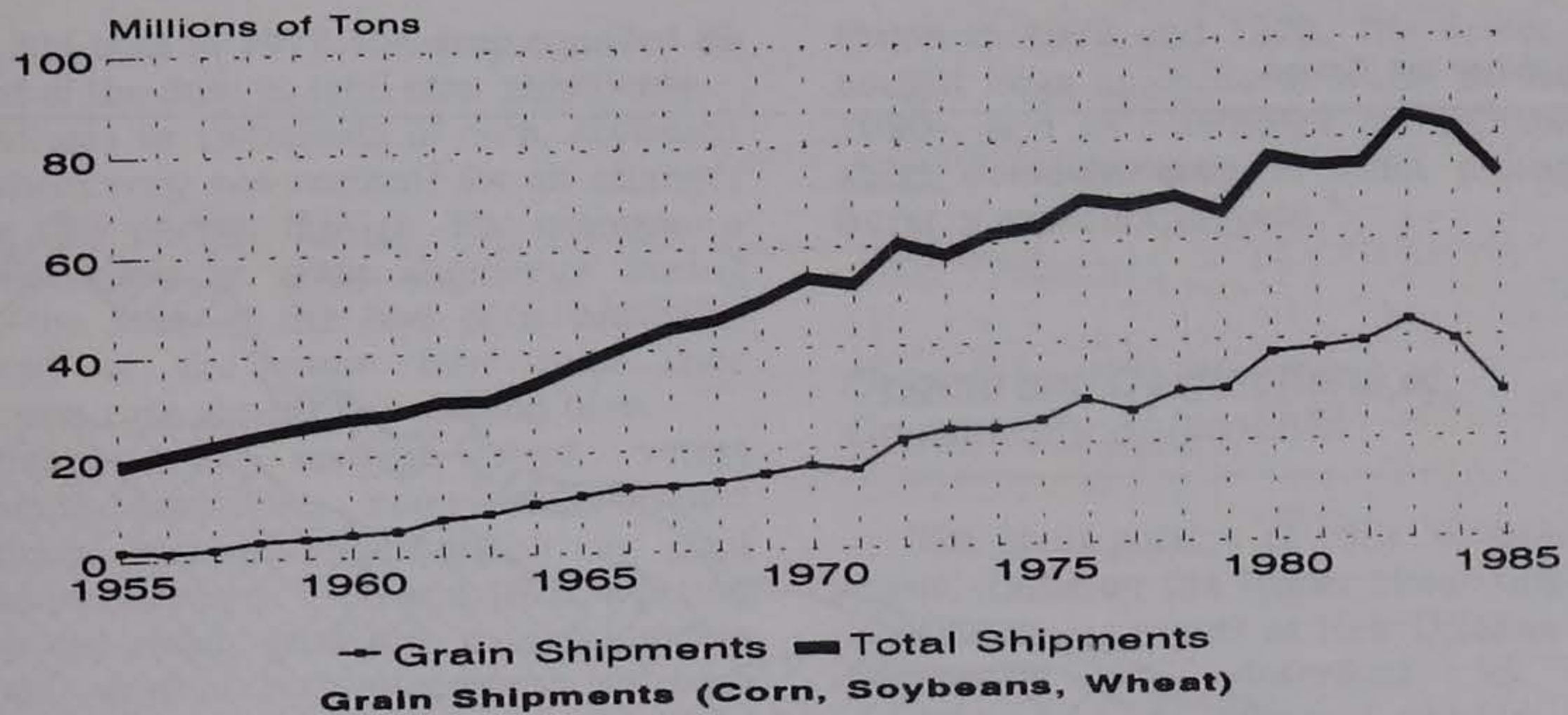
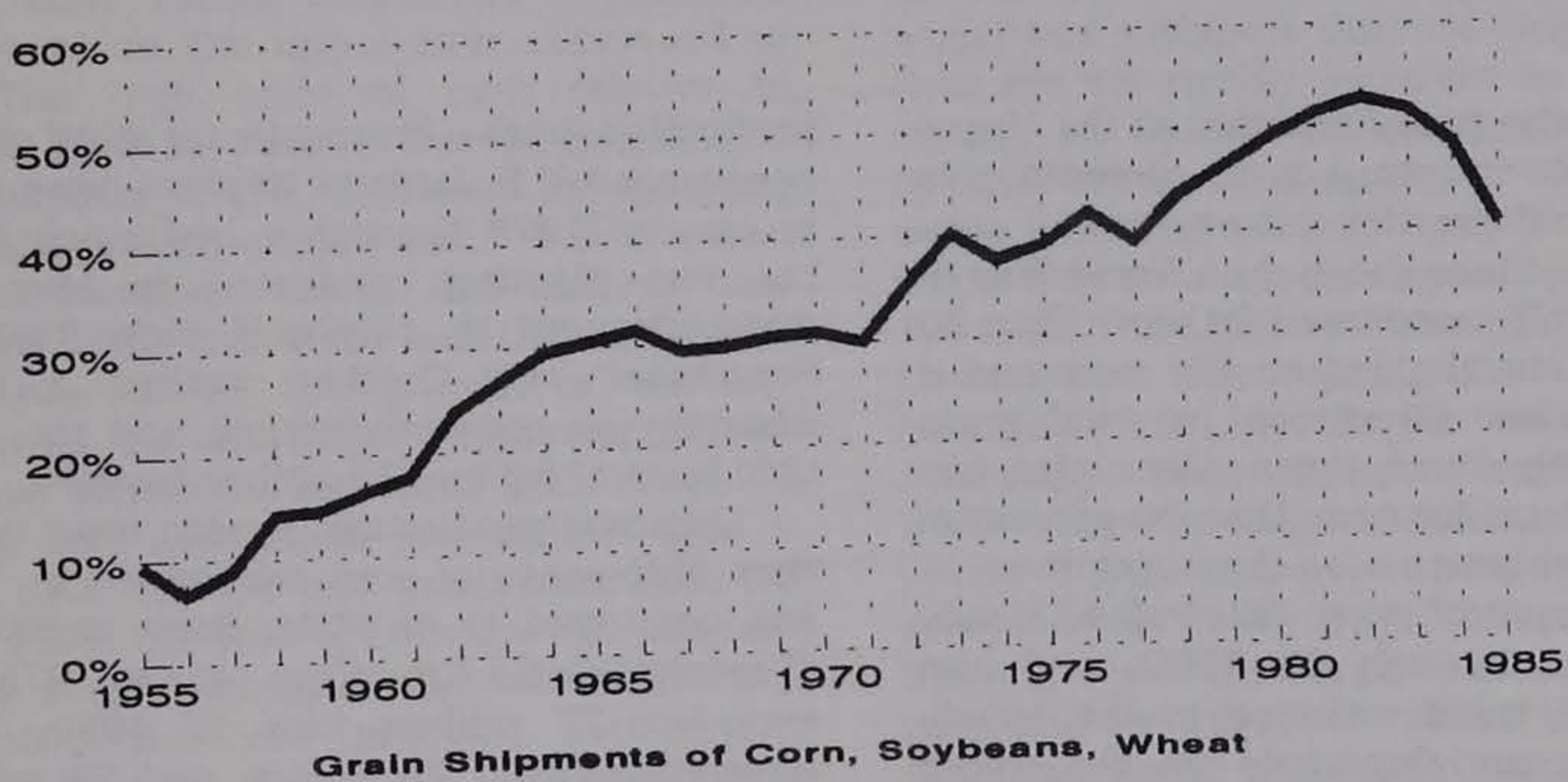


Figure 2: Grain Shipments as Percentage of Total Shipments

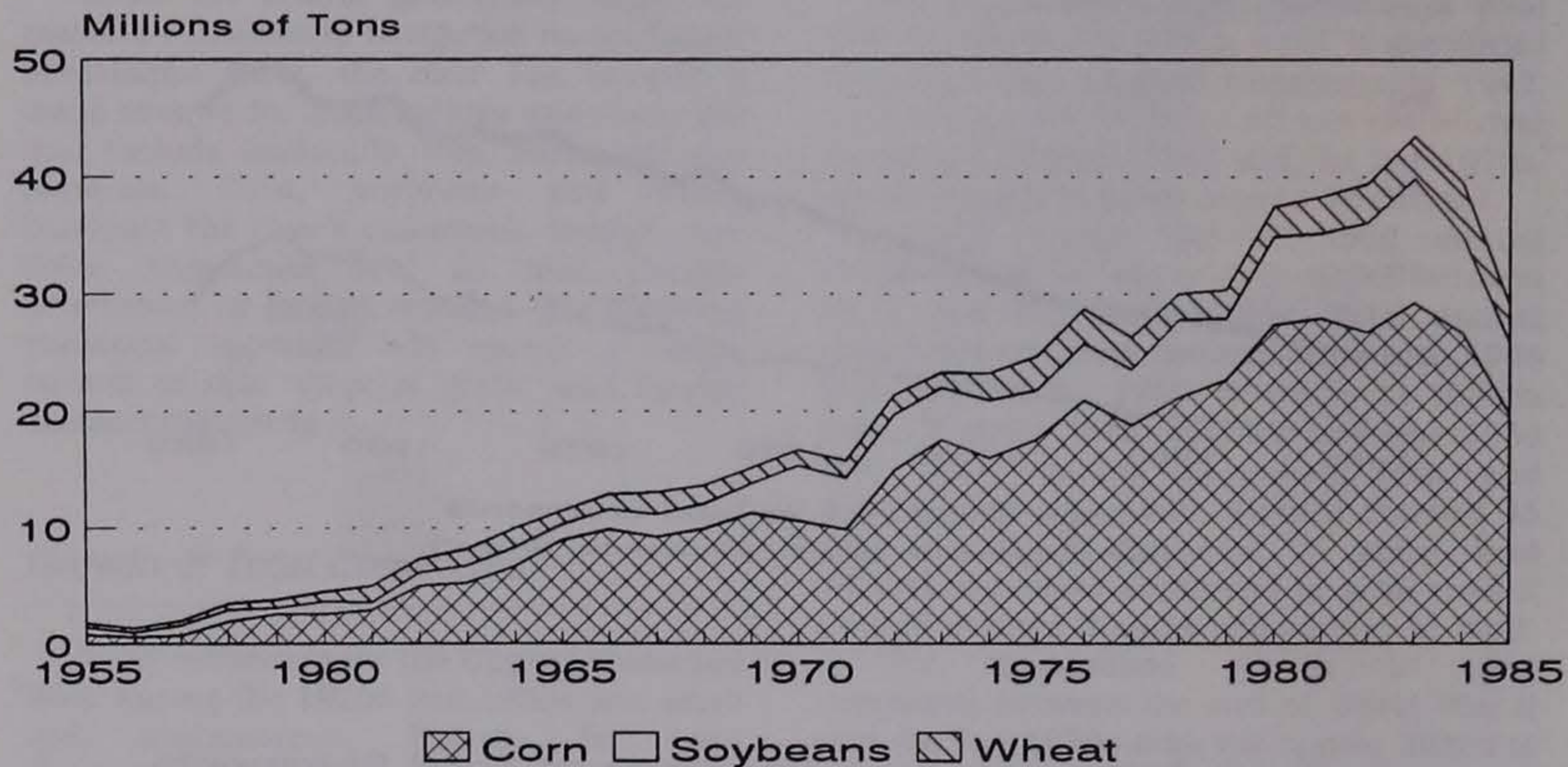


which grain exports were growing. It also begins at a time when a weak link in the upper river transportation scheme was removed. In March 1957, the Corps of Engineers opened a new 1,200-foot-long lock at the Keokuk power dam. The old lock, which was 358 feet long, was the only lock upstream from St. Louis shorter than the 600 foot standard. The opening of the new lock at Keokuk may have spurred grain shipments on the upper river. Between 1957

and 1958, grain rose as a percentage of downbound-outbound commerce from 26 percent to 44 percent, largely from corn shipments rising from 718,000 tons in 1957 to more than 1.9 million tons in 1958.

The Upper Mississippi River separates the nation's top two corn producing states, Iowa and Illinois. Given this geographical context and the importance of feedgrains, especially corn, in the booming grain markets of the 1960s and 1970s, it is only

Figure 3: Grain Shipments by Commodity



natural that the transformation of the Upper Mississippi River into a river of grain was largely a transformation into a river of corn (see figure 3). Since the end of World War II, corn has usually accounted for more than 60 percent of grain shipped on the river and it has fallen below 50 percent of total grain shipments only three times. Corn also has grown to account for more than 30 percent of total annual shipments on the upper river.

U.S. exports of corn followed a steady upward trend through the 1960s and into the 1970s, a trend reflected in the steady increase in corn shipments on the upper river. This trend faltered in 1971, when exports of corn fell due to larger exports of other feed grains and of increasing competition from other countries, especially Argentina and South Africa.<sup>2</sup> That year, corn shipments on the upper river fell off by about 600,000 tons. They soared the following year, though, as massive Soviet grain purchases siphoned off U.S. stocks and signalled the beginning of a boom in corn exports. Corn shipments on the river leaped five million tons between 1971 and 1972 and jumped another 2.6 million tons in 1973. Corn shipments fell off by 1.6 million tons in 1974 as poor weather knocked domestic

production back. Prospects for good prices encouraged U.S. farmers to plant more acres to corn in 1974 than they had since 1960, but wet planting conditions in May and June, drought in July and early frosts in September and October worked a triple whammy on corn production, and the 1974 U.S. harvest fell by 970 million bushels.

Domestic production, foreign exports and river shipments of corn rebounded in 1975 and continued to escalate. River shipments of corn totalled 17.6 million tons in 1975 and exceeded 27 million tons in 1980. They wavered between 26 million and 28 million tons until the record harvest of 1982 worked its way into the export channels and put corn shipments on the river at their all-time peak of 29.2 million tons in 1983.

Shipments of corn appear to have strongly shaped the upward trend in both grain shipments and total shipments on the upper river during the 1970s. Changes in corn shipments also seem to account for some fluctuations in total river shipments during this period: When corn shipments fell 727,450 tons in 1971, the change equalled 56 percent of the drop in total river shipments, and when corn traffic fell

1,123,324 tons in 1977, the drop equalled 89 percent of the drop in total river shipments.

Changes in shipments of corn, soybeans and wheat may not account for all changes during this period, though. For example, a small decrease in grain shipments during 1974—the year of the bad corn harvest—occurred at the same time total river shipments rose almost four million tons.

Changes in soybean and wheat shipments sometimes complemented and sometimes masked fluctuations in corn shipments. Between 1966 and 1970, a period of slow but steady growth in river shipments of grain, annual corn shipments bounced between 9.1 million tons and 11.2 million tons. During the same period, annual soybean shipments grew by three million tons in response to growing demand, especially in Western Europe and Japan.

As the growth of corn shipments faltered in the early 1980s, shipments of soybeans and wheat on the upper river continued to rise. The high price of corn relative to soybean meal in Western Europe encouraged large imports of U.S. soybeans for crushing into high protein animal feed.<sup>3</sup> U.S. soybean exports increased about four million tons between 1980 and 1982 and this expansion was reflected in the growth of soybean shipments on the Upper Mississippi River. Soybean shipments increased from about 7.5 million tons in 1980 to 10.6 million tons in 1983. (U.S. exports and production both fell off in 1983, the year of both the PIK program and a severe drought. The increased river shipments that year probably were drawn from carryover stocks of the huge 1982 harvest, the second largest on record.)

Wheat shipments on the upper river also rose during the 1980s. Annual shipments went from more than 2.5 million tons in 1980 to a peak of more than 4.5 million tons in 1984, an all-time record for wheat shipments on the Upper Mississippi River. Continuing high levels of world wheat consumption in the 1980-81 crop year contributed to high levels of wheat exports, including shipments of about 300 million bushels to China, the largest wheat sale to a single country since the transactions between the United States and the Soviet

Union in 1972 and 1973. The Soviet Union bought large amounts of wheat in the early 1980s, and its purchases in response to a short domestic crop in 1984 prompted a burst of exports that year.<sup>4</sup>

### ***Origins and Destinations of Commodity Shipments***

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The great portion of corn, soybeans and wheat traffic on the Upper Mississippi River is destined for export at New Orleans. These shipments are described as either downbound and outbound (loaded on the upper river and shipped downstream past the Missouri River) or downbound and through (loaded on other rivers, mainly the Illinois and Minnesota rivers, carried into the upper river and shipped downstream past the Missouri River). The origins of the corn, wheat and soybeans that are shipped on the river are not readily apparent in the annual reports on waterborne commerce published by the Corps of Engineers. However, the Corps analyzed this aspect of river shipments in a special report, published in 1981, for the Upper Mississippi River Basin Commission. The report, titled *Analysis of Historic Waterway Traffic on the Upper Mississippi River System*, evaluated river traffic in a wide range of commodities for the years 1970 through 1977. The report analyzed the entire Upper Mississippi River System, which the Corps defined as the main river and its tributaries above the mouth of the Ohio River, a system that includes the Illinois, Minnesota and Missouri rivers.

The report illustrates the importance of corn, wheat and soybeans to river commerce and the importance of export markets to shipments of those commodities. The three commodities comprise 98 percent of the "farm products" category, and average annual shipments in that category were much larger than average shipments in others. (Average annual shipments of coal, the second-ranked category, were less than half of these farm products.) Origins of corn, wheat and soybeans shipments varied, but New Orleans was the prime destination for

those shipments during all years of the study.†

The report described all shipments sent downstream past the mouth of the Ohio River as outbound, a description which would apply to shipments from the Upper Mississippi River that were destined for export from Gulf ports. The Illinois River was the leading point of origin for outbound corn shipments on the Upper Mississippi River system and it accounted for 45 percent to 59 percent of these shipments between 1970 and 1977. The second leading source of outbound corn shipments was a stretch between Grafton, Illinois, and La Crosse, Wisconsin, a stretch that includes Iowa's border along the Mississippi River. The third major source of outbound corn shipments was the Minnesota River, which accounted for 5.6 percent to 17.9 percent of corn traffic on the upper river. (The Corps of Engineers maintains a nine-foot channel on the Minnesota River for about 15 miles from its confluence with the Mississippi River. Five terminals, including grain terminals owned by Cargill and Bunge, are located on this section of the Minnesota River.)††

The origins of outbound shipments of soybeans are the same as for corn. The Illinois River was the leading origin of soybean shipments during every year of the study and it accounted for 32 percent to 44 percent of soybeans traffic on the Upper Mississippi River system. The stretch of the upper river between Grafton and La Crosse was the second-ranked origin of soybean shipments and accounted for 24 percent to 32 percent of outbound soybean traffic on the upper river system. From 1970 through 1972, the third-ranked origin region for these shipments was the Minnesota River. From 1973 through 1977, the third-ranked origin region for these shipments was the stretch of

the Mississippi River between the Kaskaskia River (below St. Louis) and the mouth of the Missouri River.

The Missouri River was the leading origin region for outbound shipments of wheat during the first four years of the study. Beginning in 1974, though, the Minnesota River ranked first, with shipments from terminals on that tributary accounting for 20 to 30 percent of all outbound wheat shipments on the upper river system. For six of the eight years examined in the study, the third ranked origin for wheat shipments was a stretch from the mouth of the St. Croix River (just below Locks and Dam 2 at Hastings, Minnesota) to the mouth of the Minnesota River (just above the terminals in downtown St. Paul).

The importance of exports to the movement of these commodities is commonly acknowledged. This relationship is confirmed by statistical correlations of U.S. exports of corn, wheat and soybeans with shipments of these three commodities on the Upper Mississippi River.

Correlations are statistical tools that are used to measure the strength of a relationship between two variables. Statisticians square correlations to suggest the amount of fluctuations in one variable that can be described by fluctuations in a second variable. For example, a correlation of .5 would indicate that fluctuations in one variable would account for 25 percent of fluctuations in the other variable. Correlations of more than .8 or .9 are considered extremely strong.

Correlations of river shipments of corn, soybeans and wheat with exports of these three commodities for the years 1955 to 1985 fall into the extremely strong categories. Correlations of combined shipments of the three commodities with

† An important element in production of these commodities—nitrogenous fertilizer—is shipped upstream from New Orleans. The Gulf port is the leading origin of nitrogenous fertilizer shipments to the Upper Mississippi River system, according to the Corps report. The two leading destinations were stretches between Grafton, Illinois, and La Crosse, Wisconsin, and between two Minnesota river communities, Hastings and St. Paul.

†† Congress authorized this project in 1958 (72 Stat. 298). The Corps approved the project because it would serve "existing and potential terminals. The improvement would assure the continued development of a downbound movement of grain, a movement which has been envisaged since the Mississippi River 9-foot channel was first proposed but has not materialized to any appreciable extent. . ." (U.S. Congress, Senate, *Minnesota River, Minn.*, 84th Cong., 2d sess., 1956, S. Doc. 144, p. 19.)

their combined exports is .9724; they are equally high for corn and soybeans taken separately, being .9622 for corn and .9630 for soybeans. They are somewhat weaker for wheat at .8589.

The strength of these correlations is not surprising. However, the strong correlation between total river traffic with river shipments of these three commodities and with exports of these commodities is revealing. The strength of this relationship suggests that shipments of the three commodities are prime determinants in total shipments made on the river.

The correlation between grain traffic and total traffic on the Upper Mississippi River is extremely high at .9807 and the correlation between exports and total river traffic is only slightly less at .9357. The almost absolute degree of the first correlation may seem at odds with figures that show shipments of the three commodities accounting for between 30 and 50 percent of traffic on the upper river during the years under consideration. However, they reflect the importance of the "backhaul" in river commerce.

A towboat, like a taxi or a truck, stands to lose part of the profit gained by transporting a load if the return trip is made without a paying fare. A barge line is likely to lose money hauling cargo upstream if it has to take empty barges downstream to pick up the cargo. Assuming this is the case, the effect of a drop in grain shipments could reduce shipments of other commodities by an equal amount; that is, a loss of one ton of grain shipped downstream could produce a loss of one ton of another commodity that is hauled back upstream. The strong correlations between grain shipments and total river shipments strongly suggest that fluctuations in grain tonnage have an impact on total river traffic along these lines.

## Conclusions

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Traffic on the Upper Mississippi River began a long, upward trend with the initiation of federal barge service to the Twin Cities in 1927 and with the establishment of a nine-foot channel on the upper river during the 1930s. This river traffic began to grow more rapidly after World War II, although the reasons for that increase are not indicated by an analysis of traffic in corn, soybeans and wheat. Beginning in the late 1950s, though, the shipments of these three commodities started to grow in terms of tonnage and as a percent of total traffic on the river. The extraordinary importance of these shipments to total river traffic since the 1960s suggests that grain may be the most important determinant in the level of commerce on the river. The strong correlation between grain shipments and total river traffic seems to confirm this. A correlation of almost equal strength between fluctuations in grain exports and total river traffic suggests that navigation on the river may be shaped by the same global factors that shape the world trade in grain.

If grain shipments are the most important factors in determining the level of total river commerce, the primacy of these shipments calls into question claims that navigation on the Upper Mississippi River is vital to the availability of commodities such as fertilizer or coal in the upper Midwest. These claims may be based on the assumption that barge lines will haul these cargoes consistently, when in fact the vagaries of weather and international grain markets may determine the levels of such traffic more than consumer demand.

## Appendix A Notes

1. Murray R. Benedict and Oscar C. Stine, *The Agricultural Commodity Programs* (New York: The Twentieth Century Fund, 1956), p. 206.
2. U.S. Department of Agriculture, *Feed Situation* (August 1971), p. 6.
3. *Fats and Oils Situation* (October 1981), p. 5; *Fats and Oils Situation* (February 1982), p. 5.
4. *Wheat Situation* (February 1981), p. 3; *Wheat Situation* (February 1982), p. 3, 7; *Wheat Situation* (February 1985), p. 6.

### Notes on Statistics

Statistics for annual river commerce were compiled in tons. Statistics for grain production and export were listed in thousands of bushels and converted to tons using 56 pounds as the standard weight for a bushel of corn and 60 pounds as the standard weight for a bushel of soybeans or wheat. Statistics for grain exports for 1979-1985 were converted from metric tons to bushels using the following conversion factors:

One metric ton of soybeans or wheat = 36.7437 (60 pound) bushels.

One metric ton of corn = 39.368 (56 pound) bushels.

Sources of information for river commerce, and grain production and export follow.

#### River Commerce

*Annual Report of the Chief of Engineers, U.S. Army, Part Two*. Washington, D.C.: U.S. Government Printing Office, 1923-1952.

Department of the Army, Corps of Engineers. *Waterborne Commerce of the United States, Part Two*. Washington, D.C.: Government Printing Office, 1953-present.

Department of the Army, Corps of Engineers, St. Louis District. *Analysis of Historic Waterway Traffic on the Upper Mississippi River System*. July 1981.

#### Grain Production

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*Richard Hoops is an editor at the UW-Madison Sea Grant Institute and a producer of the Earthwatch Radio program produced by Sea Grant and the UW-Madison's Institute for Environmental Studies. He did the research for this publication during graduate studies at the Department of Agricultural Journalism at the College of Agricultural and Life Sciences.*

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