

NATURE'S METROPOLIS

Chicago and the Great West

WILLIAM CRONON

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*Jacket illustration: A bird's-eye view of Chicago in 1857,
from a lithograph by Charles Inger after a drawing by I. T. Palmatary.
Courtesy, The Chicago Historical Society.*

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Pricing the Future: Grain

Prairie into Farm

The train did not create the city by itself. Stripped of the rhetoric that made it seem a mechanical deity, the railroad was simply a go-between whose chief task was to cross the boundary between city and country. Its effects had less to do with some miraculous power in the scream of a locomotive's whistle than with opening a corridor between two worlds that would remake each other. Goods and people rode the rails to get to market, where together buyers and sellers from city and country priced the products of the earth. In this sense, Chicago was just the site of a country fair, albeit the grandest, most spectacular country fair the world had ever seen. The towns and farms that seemed to spring magically into being when railroads appeared in their vicinity were actually responding to the call of that fair. But so was Chicago itself. Its unprecedented growth in the second half of the nineteenth century was in no small measure the creation of people in its hinterland, who in sending the fruits of their labor to its markets brought great change to city and country alike. "The cities have not made the country," reflected one long-time resident of Chicago in 1893; "on the contrary, the country has compelled the cities. . . . Without the former the latter could not exist. Without farmers there could be no cities."¹ Nowhere was this more true than in Chicago.

Farmers brought a new human order to the country west of the Great Lakes, as revolutionary in its own way as the train or the city itself. Potawatomis and other Indian peoples had been raising corn on small plots of land around Lake Michigan for generations, but always on a

limited scale. The new Euroamerican farmers, on the other hand, raised corn with an eye to the market, and so grew much greater quantities on much larger plots of land, especially once they could ship their harvest by rail. In addition to eating some of the grain themselves, they did things no Indians had ever done with it: turned it into whisky or fed it to hogs and other livestock, in both cases so that they could transport it more easily to market. They also began to raise crops that had never before been part of the regional landscape: old-world grains, especially wheat, as well as a wealth of fruit and vegetable species.

Like maize, which Indians had been breeding for millennia, each of these grain and vegetable crops had a long history of human use and manipulation. People had been improving them with selective breeding for countless generations, so wheat or oats or rye were themselves products of human technology—first and second nature woven together in the life of a single organism. Most varieties had become specialized enough that they could scarcely survive in a wild setting; their success thus depended on specialized habitats maintained solely by the labors of human beings. To reproduce such habitats, people resorted to a variety of tools. To prepare the heavy, dense prairie sod in order that exotic seeds could thrive in it, farmers had to turn over the grass and work the soil with plowshares and harrows made of iron and steel. To pull these heavy tools, they needed draft animals—horses and oxen—whose domestication was itself one of the great chapters in the global history of technology. Once seeds had become mature plants awaiting harvest, farmers needed still other tools—scythes, reapers, and threshers—each of which underwent important technological changes during the period of Chicago's greatest growth.²

The glaciers had left the region west of the Great Lakes unusually well suited to the organisms and farming techniques that American and European migrants brought with them.³ In the valleys where braided streams had dropped their glacial silt, and on the hillsides where dusty winds had redeposited that same silt, mineral-rich soil had been accumulating for millennia. Atop it, prairie grasses had made their own contribution. The black soil they had produced measured in feet rather than inches and contained well over 150 tons of organic matter per acre in what seemed an almost inexhaustible fund of fertile earth. The parent rock beneath often contained a good deal of lime, which the prairie grasses were adept at transporting to the surface. This kept the soil from becoming acidic, making it more suitable for the crops farmers sought to raise. Considering the favorable climate as well, it would be hard to imagine a landscape better suited to agriculture.⁴

Families trying to farm such soil at first found it almost too much of a

good thing, for the native vegetation so thrived upon it that traditional plows had trouble cutting through the sod. The grasses formed a mat so dense that in upland areas rainwater rarely sank more than six inches into the ground, preventing all but the hardiest of competing plants from taking root.⁵ Wooden plows with cast-iron edges quickly came to grief here. What farmers needed was a steel plow that could cut the tangled roots and still hold its edge—exactly the sort of plow that John Deere and other prairie manufacturers began to produce in their shops during the 1840s.⁶ Many farmers hired professional “prairie breakers” who owned oversized plows to do the initial cutting. The work had to be carefully timed, for if it was done too early the prairie grasses grew back and overwhelmed the crops; if too late, the turned-over vegetation did not rot soon enough for a successful planting in the fall. Professional prairie breaking was expensive, but well worth the cost for small landowners who could not afford to purchase special breaking equipment themselves.⁷ Spared the initial plowing, and also the task of clearing the trees and stumps which consumed so much time on forested lands back east, farmers could begin at once to seed their land.

As they did so, the native grasses—big and little bluestem, side oats grama, Indian grass, and all the others—began their long retreat to the margins of cultivation. The dozens of species that together defined the prairie ecosystem quickly gave way to the handful of plants that defined the farm. The two most popular of these were corn and wheat. Unlike their Indian predecessors, who planted with hoes and human labor, American farmers could prepare large fields of corn by plowing with draft animals. They sowed corn seed, as the prairie proverb recommended, in the spring when oak leaves were the size of a squirrel’s ear. To protect the young seedlings from weeds, they ran harrows and plows between the rows several times before the Fourth of July, when the plants could usually fend for themselves. Families had to harvest corn by hand, but that task could wait until October or November, or even the following spring, with little damage to the crop. Even though corn brought low prices—few Americans, and even fewer Europeans, regarded it as a prime food grain—it became a major part of prairie agriculture. People might not enjoy eating corn, but animals loved it; moreover, its crop yields were extraordinary compared with those of other grains.

Because bread was near the center of most American and European diets, wheat was the classic cash crop of western farming. Highly popular in most early frontier communities, it brought the best market prices of any grain, and was a ready source of income in a way that corn was not (unless first converted to pork or alcohol). Farmers sowed winter wheat in the fall, harrowed it to cover the seeds, and then harvested it in spring or

early summer. Unfortunately, wheat farmers in Illinois and Iowa experienced a series of bad harvests in the late 1840s and early 1850s, caused by bad weather, winterkill, blight, rust, and various insect attacks. They tried many different techniques for responding to these problems, sheltering the wheat seeds to protect them from winterkill and changing the timing of crops so that they would not coincide with the life cycles of pest insects, but winter wheat continued to have difficulties. Many farmers therefore turned to spring wheat, which they planted after the thaw and harvested in late summer or fall.

Harvesting wheat was always much trickier than harvesting corn. Each ear of corn sat protected in its own husk, and so generally remained undamaged by wind, rain, or the death of its parent plant. Not so with wheat and the other small grains, which could topple from their own weight, or drop seeds to the ground when overmature, or rot if harvested wet. Timing was everything, causing considerable anxiety to farmers for whom a few days might make the difference between a profitable crop and a failed one. The hazards and hard labor of harvesting wheat were the chief reasons that prairie farmers responded quickly when Cyrus McCormick began to sell mechanical reapers from his Chicago factory in the 1840s and 1850s.

Risks such as these kept farmers from depending too heavily on any single grain. Although no farm resembled the original prairie in diversity of plant species, the typical one grew several crops, each in its own monocultural field. Wheat and corn were the most popular, wheat because it served as the classic frontier cash crop, corn because it was prolific and served well as animal feed. Farmers tried to arrange plantings of other crops so that they would not interfere with the life cycles and labor requirements of these two mainstays. Oats, rye, and barley sometimes got fields for themselves, with oats becoming more popular in the years following the Civil War as Chicago and other cities began to purchase large quantities for horse feed. For animal feed closer to home, farmers relied on hay, which they cut on remnant prairies in their vicinity. As prairies became scarcer later in the century, "tame grasses" raised in separate meadows took their place, with timothy, bluegrass, and clover the preferred crops.⁸ Farm animals fed themselves on open pastures during the warm months of the year, and then subsisted on hay and corn when pastures gave out in the winter. For their part, farm families raised a variety of garden vegetables for use at home, ranging from root crops like potatoes and onions to legumes like peas and beans to cucurbits like melons and squash. Dairy cows supplied milk, cheese, and butter; poultry laid eggs; hogs produced pork; sheep yielded wool and mutton; and orchards rounded out the family diet with apples and cider. Every farm was

a carefully partitioned landscape of fields, crops, and animals, each with its own unique requirements and life cycle. Farm families organized their lives around the delicate task of orchestrating these cycles, and tending the creatures that inhabited the small artificial ecosystem.

To make the farm succeed, people had to erect a variety of structures to divide the local landscape and protect its inhabitants: a farmhouse for the family, a barn and other outbuildings for the animals, sheds for tools and machinery, and fences to separate the pastures where animals grazed from the fields and meadows where plants grew. These structures were among the most visible symbols of second nature in the rural landscape, endlessly proliferating as farmers moved onto new soils.⁹ But in building them, people had to confront the vice of the prairie's virtue: land that had no trees to be cleared for plowing also had no trees to be cut for lumber. The compromise solution in the beginning was to stay in the borderland between woodland and grassland. Early settlers located their farms near watercourses, which flowed like wooded ribbons through otherwise treeless landscapes. As one emigrant handbook reported in 1838, the first prairie farms were "usually made on that part of the prairie which adjoins the timber," producing "a range of farms circumscribing the entire prairie as with a belt."¹⁰ Farmers eventually fanned out from these woody areas but continued to rely on them for lumber and fuel. Even where no trees grew, wooden fences and buildings stood as silent reminders that those who inhabited the farm landscape survived by mingling the products of the forest with those of the prairie.

As people erected wooden structures on their land, they committed themselves to a practice that undermined the prairie ecosystem as subtly as farming itself. In addition to plowing up the sod, farmers did their best to stop the annual fires—many of them set by Indians—that had formerly kept trees from invading the grassland.¹¹ It made no sense to spend hundreds of hours and dollars erecting fences or building barns only to have them burn to the ground. So rural inhabitants employed various techniques—plowing firebreaks, mowing fields, reducing natural fuel sources, and fighting fires directly—to diminish the number of fires. Once fires ceased to burn back saplings, trees reappeared on whatever lands escaped the effects of plow or pasture, eventually creating a patchwork of small woodlots on land where farmers let them grow. Prairies, in other words, gave way before fields and forests alike. Still, the regrowth of oaks and other native hardwoods was too slow to supply the farmers' voracious demand for lumber and fuel. It was not long before farm families on the prairies looked to merchants in Chicago and elsewhere for alternate supplies of timber.

Fields, fences, and firebreaks were concrete embodiments of the envi-

ronmental partitioning that made farming possible, but they also expressed the underlying property system that divided the land into ownership rights. Few other regions in the United States were better suited to the system which the government had used since 1785 for selling public lands, subdividing the nation into a vast grid of square-mile sections whose purpose was to turn land into real estate by the most economically expedient method. By imposing the same abstract and homogeneous grid pattern on all land, no matter how ecologically diverse, government surveyors made it marketable. As happened during Chicago's land craze of the 1830s, the grid turned the prairie into a commodity, and became the foundation for all subsequent land use.¹²

Starting in the second decade of the nineteenth century, when the government first began selling land in southern parts of Illinois, arriving settlers purchased their property in arbitrary units of sections, half sections, and 160-acre quarter sections. An apparently uniform terrain whose natural boundaries were so subtle as to seem almost invisible meant that the survey's checkerboard pattern caused few obvious problems: the grid gave shape to the pastures, meadows, and cornfields of a new agricultural order.¹³ From that order would come a cornucopia of wheat and corn, livestock and poultry, all held within neatly rectilinear frames. Rectangular fields meant that farmers and horses could cut long, straight swaths whether they pulled plows, harrows, or newfangled tools like reapers. Because farm fields were large, uniform, and relatively free of rocks or other obstructions, prairie farmers enjoyed economies of scale which left them better able to adopt new agricultural machinery than many of their eastern counterparts—once they could afford to do so.

Despite the outward appearance of the grid, not all lands were equally advantageous. As the shopkeepers of Chicago learned to their sorrow, the flatness of the prairies subjected lowland areas to bad drainage and flooding. J. M. Peck's emigrant handbook warned arriving settlers in 1831 that farmers could easily get themselves into trouble by buying such land. "The emigrant," Peck wrote, "may mistake [*sic*] in the dry season, and fancy he has a rich, level, and dry farm in prospect, but the next spring will undeceive him." During wet seasons, water stood in plowed furrows and kept the soil dense and compact; during dry seasons, the land baked and cracked from drought.¹⁴ Finding the ideal farm site entailed striking a balance between lands that had too much water and lands that had too little. Farmers tried to settle far enough from floodplains and wet prairies to avoid bad drainage, but they also needed to be near enough to a stream course to obtain supplies of wood and water.

Watercourses offered another advantage as well. Given the poor state of frontier roads, the rivers of the prairie were its highways. Farmers often

sought to float their goods to market, for the land's flatness meant that prairie rivers had few rapids and were easily navigable when they held enough water. What the traveler Henry Rowe Schoolcraft said of the Illinois River in 1821 described many lesser streams as well: "the water," he wrote, "moves sluggishly, and, indeed, has more resemblance to a canal than to a stream."¹⁵ Although one might travel slowly on such a river, one also traveled with relative ease and safety.

To go to market, farmers had either to build a raft or flatboat themselves or, as happened more often, to sell crops to a local merchant who combined them with other farmers' produce for shipment up or downstream.¹⁶ Before 1850, typical western flatboats cost anywhere from \$40 to \$140 to construct, and might carry up to one hundred tons of produce.¹⁷ On larger rivers, especially the Mississippi, one could book passage and ship goods on steamboats. Farmers still had to use wagons to reach the waterways, but one of the chief reasons they initially stayed on the margins of the prairies was to keep the trip to the river as short as possible. Just as booster theories suggested, waterways gathered produce from the countryside and swept it toward the markets—towns, cities, and would-be metropolises—that lay downstream.

For all these reasons, Euroamericans' initial agricultural occupation of the prairie country took place mainly along the spines of the chief watersheds.¹⁸ As in Chicago, the earliest fur-trading communities had already located along the banks of important rivers and harbors. Farm settlements tended to spread out from these early market centers. When Chicago began its growth in 1833, the only sizable non-Indian populations in Illinois lived near St. Louis in the southwestern corner of the state—along the banks of the Mississippi and the lower reaches of the Illinois—and in the lead-mining district around Galena in the northwest. (Settlers occupied the Iowa side of the Mississippi at about the same time.) Two decades later, in 1850, settlements had begun to appear throughout the interior of the state, but population densities continued to be greatest along the river corridors: outside of Chicago's immediate vicinity, the Mississippi, Illinois, and Rock river valleys contained most of the state's inhabitants. The largest farm populations continued to cluster around St. Louis, which still had the best market in the region, but the construction of the Galena and Chicago Union Railroad had also begun to increase settlement west of Chicago.¹⁹

The settlers came from many places. Before the 1833 land rush, the major influx of population came via the Ohio and Mississippi rivers, with southern states—Kentucky, Tennessee, and Virginia as well as southern Ohio and Indiana—accounting for a disproportionate share of settlers. At the same time, a number of British families began to arrive either individ-

ually or in colonies.²⁰ By 1850, as the Great Lakes started to carry more passenger traffic, increased numbers of settlers from New York, Pennsylvania, and New England were joining the stream of new arrivals. In their midst were more and more foreign-born migrants, with Great Britain, Ireland, and Germany contributing the greatest shares. Foreign migrants settled disproportionately in cities: although Illinois as a whole was only 12.5 percent foreign-born in 1850, fully half of Cook County's inhabitants (most of them living in Chicago) had been born outside the United States.²¹ The relative "foreignness" of cities like Chicago, Milwaukee, and St. Louis continued throughout the century, but rural settlements also had their share of immigrant farm families.

A Sack's Journey

Whatever their ethnic origin, whether they spoke German or English, increasing numbers of farmers meant increasing quantities of crops. Settlers did not solve the problem of selling those crops simply by hauling them to the banks of the nearest river. They also had to find customers for them, which was not always easy to do in a sparsely settled landscape with few towns and even fewer cities. Farmers sold much of what they grew to merchants and storekeepers in their immediate vicinity, acting out one of the key market relationships in the emerging agricultural economy. "There are," wrote Rebecca Burlend of her experiences as an immigrant Englishwoman in southern Illinois during the 1830s, ". . . what are termed store keepers, who supply the settlers with articles the most needed, such as food, clothing, implements of husbandry, medicine, and spirituous liquors: for which they receive in exchange the produce of their farms, consisting of wheat, Indian corn, sugar, beef, bacon, &c."²²

As Burlend suggests, the earliest storekeepers in rural areas wore at least two hats: at the same time that they sold farmers retail goods, they also served as wholesalers of farm crops because their customers had nothing else with which to pay for merchandise.²³ Storekeepers needed enough capital to purchase and warehouse farm produce in sufficient quantities to justify shipping it off to more distant markets. Their financial resources, although by no means large compared with those of urban merchants, sometimes allowed them, as Burlend said, to "exercise a sort of monopoly over a certain district," with the result that "their profits are great, and they often become wealthy."²⁴ Compared with most farmers, who could command little capital and credit, even the keeper of a small village store looked well-to-do, at least in good years. But whatever the

disparity between farmers and storekeepers in relative wealth, each performed an essential function for the other. Without the farmers, storekeepers would have had neither customers to sell to nor crops to buy. And without the storekeepers' willingness to purchase produce and extend credit in advance of the harvest, many farmers could not have survived their own lack of capital in growing crops and bringing them to market.

Merchants could earn greater profits than farmers, but they also faced the prospect of considerably greater losses. Given the problems of water transport and the poor quality of information about prices in distant markets, wholesaling farm crops in pretelegraph, prerailroad days could be risky indeed. "No one can realize," wrote the merchant John Burrows of Davenport, Iowa, "the difficulties of doing a produce business in those days. We had no railroads. Everything had to be moved by water, and, of course, had to be held all winter."²⁵ It was all too easy to buy wheat and other crops in the fall and then find little or no market for them the following spring.

Burrows himself described a harrowing experience in the spring of 1844 involving a flatboat he had loaded with 2,500 bushels of potatoes. Although he was initially offered fifty cents a bushel for them at the mouth of the Illinois River, he refused, anticipating that he would sell them instead in New Orleans, where he had heard they were selling at \$2.00 a bushel. Floating south, he discovered to his dismay that the prospect of high prices had encouraged other merchants to send potatoes toward New Orleans as well. The market was becoming glutted, so prices fell steadily as he moved downstream. By the time he reached Memphis, potatoes were bringing only twenty-five cents a bushel, and when he reached New Orleans, six weeks after he had started, there was no market for potatoes at all. He was finally forced to sell them—taking payment in coffee—to a Bermuda ship captain for eight cents a bushel, which, as Burrows lamented, "was just nothing at all," as it cost him "all of that to sprout, barrel, and deliver them."²⁶ One could easily go bankrupt under these circumstances, and many merchants did.

Rebecca Burlend defined the essential relationship between farmer and storekeeper when she wrote that stores "are in Illinois, nearly what markets are in England, only there is more barter in the former country."²⁷ Farmers bartered their produce because they were cash poor. In an economy short of cash, where credit was essential to making exchange possible, merchants served as translators between the world of rural barter and the world of urban money. Because storekeepers sold almost anything farmers needed, the general store became the outpost of a mar-

ket economy whether it was located in a town, in a village, or in the middle of a prairie. By buying, storing, shipping, and reselling farm produce, merchants linked farm communities to the trade of a wider world.

The gateways to that trade were almost invariably located in cities, which acted as funnels for the increasing flood of grain and other farm products being sent out of the countryside. Although Chicago was beginning to emerge in the 1830s and 1840s as a center for Great Lakes shipping, it lacked a water connection with inland areas until the canal opened in 1848. For most early farm settlements on the Illinois and Iowa prairies, the easiest markets to reach were downriver, at St. Louis or, more remotely, New Orleans. When the English traveler William Oliver visited St. Louis in 1842, he reported that the city had "a daily and extensive market for all country produce," making purchases from "a large portion of the surrounding district, within a distance of sixty or seventy miles." The inhabitants of St. Louis consumed some of this produce themselves, but most of it wound up in "the numerous and crowded steamers," which Oliver said were "doubtless the cause of such a constant and large demand."²⁸ Goods loaded onto steamers or flatboats might be consumed on board, sold to smaller communities along the river, or shipped to New Orleans for resale or transfer to oceangoing vessels bound for ports on the eastern seaboard and Europe.

Before the coming of the railroad, people traded grain at St. Louis and Chicago in similar ways, although the physical circumstances of the two towns differed markedly.²⁹ In both cities, the chief market for agricultural produce was along the waterfront. Of the two, Chicago seemed less suited by geography to accommodate the trade of its river. Most of the city's grain merchants conducted their business in the vicinity of South Water Street, immediately adjacent to the south bank of the Chicago River.³⁰ Warehouses fronted directly on the water, rising three or four stories above it and leaving little room for wagons to maneuver. Ships were equally crowded in the narrow waterway. So hemmed in was the river that it did not figure very prominently in people's mental image of the city. Visitors to Chicago often mentioned the crowded bustle of its streets and the long traffic jams that occurred when drawbridges over the river were open, but they scarcely seemed to notice the river's wharves and piers. Perhaps because Lake Michigan was so much more powerful as a visual icon, the Chicago River dominated people's sense of Chicago much less than the Mississippi shaped perceptions of St. Louis.

In St. Louis, the wharves were the heart of the town, so much so that few visitors—most of whom arrived by boat—failed to comment on them. The city's buildings sat well back from the riverfront to escape the Missis-

issippi's annual rise during spring floods. A broad open area known simply as the levee sloped down toward the river for the entire length of the town. The levee amounted to nothing less than a vast open-air market. As the German visitor Moritz Busch noted in 1852, "The landing square is regarded as the center of the city."³¹ William Oliver said of it, "Large steamers are very frequently arriving and departing, and there is a constant bustle of lading and dislading at the levee."³² When trading season was at its height, supplies overflowed the warehouses and piled up on the banks of the river, so the streets became "almost blockaded with boxes, barrels, bales and packages, much coming in, much also, going out."³³

Whether on St. Louis's levee or Chicago's South Water Street, selling grain in the 1840s was a fairly straightforward business. A merchant like Burrows in Davenport would sack up the grain he had purchased from farmers in his vicinity, load it onto a flatboat or steamship, and float downstream to the docks at St. Louis. To reach Chicago during the 1840s, he would have made a similar trip by wagon. Once he arrived, he would unload his grain and try to sell it for cash to dealers who needed it to meet local demand. Much of the street and levee activity that struck visitors in Chicago and St. Louis consisted of sellers trying to find buyers and buyers trying to find sellers for the sacks of grain lying on the ground around them. One Chicago reporter said the buyers reminded him of nothing so much as "bees in a clover field."³⁴ As often as not, local dealers had all the grain they needed for home use, and so the would-be seller next turned to a commission merchant. Commission merchants made money not by buying grain on their own account but by arranging for its transportation to a larger city—New Orleans or New York being the two most obvious choices—where it might find a more welcoming market. The country merchant or farmer paid a commission for this service and took whatever profits or losses resulted from the final transaction.

To grasp the changes in grain marketing that occurred in Chicago during the 1850s, one must understand several key features of this early waterborne trading system. All hinged on the seemingly unremarkable fact that shippers, whether farmers or merchants, loaded their grain into sacks before sending it on its journey to the mill that finally ground it into flour. As the sack of grain moved away from the farm—whether pulled in wagons, floated on flatboats, or lofted on stevedores' backs—its contents remained intact, unmixed with grain from other farms. Nothing adulterated the characteristic weight, bulk, cleanliness, purity, and flavor that marked it as the product of a particular tract of land and a particular farmer's labor. When distant urban millers or wholesalers decided to buy the grain, they did so after examining a "representative sample" and then

offering a price based on their judgment of its quality. Within any given level of market demand, price reflected how plump, clean, and pure a farm family had managed to make its grain.³⁵

Intrinsic to this system of sack-based shipments was the fact that ownership rights to grain remained with its original shipper until it reached the point of final sale. The farmer or storekeeper who sold grain to a Chicago or St. Louis commission merchant continued to own it as it traveled the hundreds of miles to New Orleans or New York. This meant that the shipper bore all risks for damage that might occur during transit. If the grain became waterlogged, if it began to spoil in warm weather, if prices collapsed before it reached market, or if its ship sank, the resulting losses accrued not to the commission merchant or the transport company but to the original shipper.

Because these risks remained in the hands of farmers and merchants who were often of small means, insurance was a key service sold in large cities such as St. Louis or Chicago. Sellers of fire, marine, and commercial insurance, many of them agents of eastern companies, were among the largest businesses in Chicago by the 1840s, when at least one of them outranked city banks in financial resources.³⁶ Without the services of such firms, small shippers could all too easily face bankruptcy if some disaster happened before they could sell their goods. John Burrows described having been forced to delay his ill-fated potatoes on their journey to New Orleans because no one in St. Louis was initially willing to insure them: "I did not dare to send them forward without insurance," he wrote, "as my capital was all there."³⁷ Burrows's problem was finally solved by one of the largest St. Louis grain dealers, who supplied insurance on the condition that Burrows safeguard his potatoes by physically accompanying them on their journey downstream. Urban commission merchants often sold insurance in this way, and also advanced credit to shippers while goods were traveling to market—but both acts were implicit statements that ultimate legal responsibility remained with the shipper.

Sacks were the key to the whole water-based transportation system. Since grain originated in farms and villages that had only small quantities to sell, it had to start its journey on a modest scale, ideally suited to small groups of sacks. Once embarked on the river passage, sacks offered a convenient solution to the problem of loading the irregular holds of flatboats, keelboats, and steamboats. Moving goods by water almost always meant transferring them several times along the way, from pier to flatboat, from flatboat to levee, from levee to steamboat, from steamboat to sailing craft. Such transfers worked best if shipments were small enough that their weight and bulk did not prevent an individual worker from handling them. Moving grain on and off a ship usually meant negotiating

tortuous passageways—across gangways, down stairs, through corridors, into storage bins—and the more complicated the path, the more critical the need to keep down the size of the unit being moved. Beyond these purely physical problems of water-based grain handling, the prevailing apparatus for transferring ownership rights also worked in favor of the sack system. Shippers and their customers wanted to know exactly what they were selling and buying, so it made sense not to break up individual shipments or mix them with others. In all these ways, marketing and transportation systems reflected each other. Sacks and ships seemed an ideal combination.

The water-based grain-marketing system at midcentury was thus designed to move wheat, corn, and other cereal crops without disrupting the link between grain as physical object and grain as salable commodity. At every point where grain moved from one form of transportation to another, it did so in individual bags on the backs of individual workers. Wherever it had to wait at transfer points, it did so in warehouses that kept individual lots carefully separated from each other. When shippers completed their final sales, they sold the rights to actual sacks of physical grain. A farm family sending a load of wheat from Illinois to New York could still have recovered that same wheat, packed with a bill of lading inside its original sacks, in a Manhattan warehouse several weeks later. The market had as yet devised few ways of separating grain as a priced commodity from the grain that had so recently clung to yellow stalks on the windy hillsides of former prairies.

The Golden Stream

The railroads changed all this. By giving rural shippers an alternative way to reach urban markets, they rerouted the flow of farm produce and encouraged new settlement patterns in the areas they serviced. Migrants to Illinois and Iowa had previously settled mainly in the river valleys nearest St. Louis; after 1848, they moved most quickly into the railroad corridors west of Chicago.³⁸ As they arrived, new settlers increased agricultural production on upland prairies which had heretofore seen little farming: the route of the Illinois Central, for instance, gave new access to the previously unsettled counties of the Grand Prairie in central Illinois.³⁹ Equally important were the grain shipments out of already settled areas which had formerly had no alternative to rivers for bringing crops to market.⁴⁰ By lowering land transportation costs, the railroad allowed farmers to sell more grain and heightened their expectations about the scale of their own production.

The predictable result was an explosion in Chicago's receipts of grain. As late as 1850, St. Louis was still handling over twice as much wheat and flour as Chicago, but within five years the younger city had far surpassed its older rival. The same shift occurred in the waterborne corn trade after 1848 when the Illinois and Michigan Canal began to bring corn north toward Lake Michigan.⁴¹ As the canal and railroads increased the flow of grain into Chicago's warehouses, they simultaneously encouraged an expansion of shipping out of its harbor, contributing to a general reorientation of western trade toward the east and away from the south. Between 1850 and 1854, the net eastward movement of freight shipments via the Great Lakes finally surpassed shipments out of New Orleans.⁴² No place was more important than Chicago to this redirection of agricultural trade. The city and its merchants changed forever the way prairie farmers could sell their crops. At the same time, the farmers and their crops fundamentally altered Chicago's markets.

The immense amounts of grain pouring into Chicago expanded the city's markets, but quantity alone was not the whole story. Compared with other modes of transportation, railroad cars moved grain more quickly and in standardized carloads of medium size. With whole freight cars, for instance, carrying nothing but wheat, shippers and railroad managers soon came to think of grain shipments not as individual "sacks" but as "carloads" consisting of about 325 bushels each.⁴³ The railroad brought grain into the city through the narrow gateways represented by tracks, sidings, and stations. As more and more trains passed more and more frequently through those gateways, adding their grain to the loads that farmers were still hauling in their wagons, freight traffic congestion became more of a problem. As the *Chicago Democratic Press* reported during the harvest season of 1854, "The piles of grain now lying uncovered in our streets, the choked and crowded thoroughfares, the overloaded teams, the bursting bags, . . . all testify to a wide-felt want of room. . . . We want more warehouses. . . . We want more cars and locomotives."⁴⁴

Geography and the logic of capital meant that congestion *felt* different in Chicago than in St. Louis. The 2.1 million bushels of wheat that passed across the St. Louis levee in 1854 moved among hundreds of boats and ships scattered along hundreds of yards of waterfront.⁴⁵ Hundreds of individuals, many of whom possessed only small amounts of capital, shared responsibility for making sure that grain continued safely on its journey. Although the 3.0 million bushels of wheat that passed through Chicago during that same year was only moderately larger than St. Louis's shipments in total size, well over a million of those bushels entered the city via the tracks of just one railroad, the Galena and Chicago Union.⁴⁶ In Chicago, a small group of railroad managers bore the heavy

financial responsibility of moving millions of bushels of grain. Given the large capital investment represented by a railroad's cars, sidings, and other equipment, managers had a strong incentive to accelerate the speed with which employees emptied grain cars and returned them to active service. Rapid turnaround was imperative if managers were to maximize their use of capital equipment and prevent congestion.

Achieving these goals meant getting grain out of its sacks, off the backs of individual workers, and into automatic machinery that would move it more rapidly and efficiently. The invention that made this possible was among the most important yet least acknowledged in the history of American agriculture: the steam-powered grain elevator.⁴⁷ First introduced in 1842 by a Buffalo warehouseman named Joseph Dart, it was soon adopted by grain dealers in Chicago as well. By the end of the 1850s, Chicagoans had refined their elevator system beyond that of any other city, leading the way toward a transformation of grain marketing worldwide.⁴⁸

Structurally, the elevator was a multistoried warehouse divided into numbered vertical bins containing different lots of grain. But as Anthony Trollope observed of his visit to a Chicago elevator in 1861, "it was not as a storehouse that this great building was so remarkable, but as a channel or a river course for the flooding freshets of corn."⁴⁹ What distinguished an elevator from earlier warehouses was its use of machinery instead of human workers to move grain into and out of the building. Grain entered the structure on an endless steam-powered conveyor belt to which large scoops or buckets were attached. After riding the buckets to the top of the building, the grain was weighed on a set of scales—a technique that soon encouraged Chicago dealers to define their standard bushels according to weight rather than volume.⁵⁰ Grain dropped out the bottom of the scale into a rotating chute mechanism, which elevator operators could direct into any of the numbered bins inside the warehouse. Once it was inside the bins, workers could deliver grain to a waiting ship or railroad car simply by opening a chute at the bottom of the building and letting gravity do the rest of the work.⁵¹

Small horse-powered elevators were used in Chicago throughout the prerailroad 1840s, but it was not until 1848 that the first steam-powered grain elevator appeared. Built by Captain Robert C. Bristol, it was a four-story brick building measuring 75 feet square and having a total capacity of over 80,000 bushels.⁵² Large by the standards of its day, Bristol's elevator was soon dwarfed by larger ones as the flow of grain through the city increased. Within less than a decade the largest elevators in Chicago—all either owned by or closely affiliated with major railroads—were almost ten times bigger than Bristol's.

Elevators of this size were constructed from two-inch wooden planks bolted on top of each other and bound with iron rods to form walls ten inches thick. The Chicago and Rock Island Railroad's largest warehouse in 1856, with a 700,000-bushel capacity, contained ninety bins measuring 10 feet by 22 feet and standing 41 feet high. They were served by ten conveyor belt elevators, and the entire structure weighed 2,400 tons when full of grain.⁵³ The multiplication of such facilities during the 1850s gave Chicago the ability to handle more grain more quickly than any other city in the world. By 1857, it had a dozen elevators whose combined capacity of over four million bushels meant that the city could *store* more wheat than St. Louis would *ship* during that entire year.⁵⁴

Now some of the hidden costs of the river transportation system began to be more apparent. Chicago newspapers delighted in describing the way St. Louis might deal with a steamboat carrying 100,000 bushels of grain:

It comes in sacks—which have to be taken from the boat by a crowd of lazy laborers, who wearily carry it on their shoulders, sack by sack, and pile it on the levee. There it has the privilege of laying twenty-four hours, when it has to be moved in drays, either to a warehouse, or to some part of the levee to be shipped, where the same slow process has to be repeated. Everything is done by manual labor. . . .⁵⁵

The net result was that a 100,000-bushel shipment of grain arriving in St. Louis might involve “the labor of probably two or three hundred Irishmen, negroes and mules for a couple of days.”⁵⁶ One cannot, of course, accept such descriptions at face value, given the pro-Chicago, antiblack, and anti-Irish prejudices that came easily to this booster author. The slowness of those “Irishmen, negroes and mules” had less to do with laziness than with the inherent difficulties of hauling so many burlap sacks from one vessel to another. The work was hard, the transport technology crude, and grain thus took its time passing through St. Louis.

The movement of grain on the rivers had always been labor-intensive, and remained so as long as shipments continued to travel in sacks. As a result, St. Louis enjoyed few economies of scale as the trade of its levee grew; instead, it simply increased its employment of dockworkers, many of them slaves and recent immigrants. Elevator construction was discouraged by the fact that no single carrier on the river could guarantee a steady flow of grain through such a facility comparable to the golden torrent delivered by Chicago's railroads. The ease of constructing cheap flatboats set a limit on how much capital could profitably be invested in large steamboats, which in turn discouraged the development of more

expensive grain handling equipment.⁵⁷ Beyond this, the constantly changing height of the Mississippi River, which rose and fell by more than forty feet during extreme seasons, suggested to many that permanent grain elevators would never be practical on the levee: if they were constructed far enough from the river to escape the spring floods, they would be too far from the riverbank during the rest of the year.⁵⁸ (In this respect, the apparent disadvantages of the Chicago River's "sluggish, slimy steam, too lazy to clean itself," proved unexpectedly beneficial to trade.)⁵⁹ For all these reasons, antebellum St. Louis investors were unwilling to risk the hundreds of thousands of dollars needed to build elevators similar to those in Chicago.⁶⁰ St. Louis did not have a working grain elevator until after the Civil War.⁶¹ As a result, sacks of grain passing through the river city had to pay an overhead cost of six to eight cents more per bushel for additional handling.⁶² Even the sacks themselves cost two to four cents apiece.⁶³

The increasing scale and efficiency of Chicago's grain-handling technology depended on one condition: moving wheat, corn, or other crops without recourse to old-fashioned sacks. Grain entering Chicago might arrive in wagons or canalboats or railroad cars, but to move up an elevator's conveyor belts, it had to be sackless. Only then could corn or wheat cease to act like solid objects and begin to behave more like liquids: golden streams that flowed like water. If farmers avoided sacks and simply loaded their grain directly into a railroad car or canalboat, an elevator chute inserted into the vehicle could lift and pour the grainy liquid into any elevator bin ready to receive it. The *Chicago Daily Press* described the process in 1857 as follows:

Our warehouses are all erected on the river and its branches, with railroad tracks running in the rear of them, so that a train of cars loaded with grain may be standing opposite one end of a large elevating warehouse, being emptied by elevators, at the rate of from six to eight thousand bushels per hour, while at the other end the same grain may be running into a couple of propellers [ships], and be on its way to Buffalo, Oswego, Ogdensburg or Montreal within six or seven hours. And all this is done without any noise or bustle; and with but little labor, except that of machinery.⁶⁴

A large elevator like that of the Illinois Central could simultaneously empty twelve railroad cars and load two ships at the rate of 24,000 bushels per hour. It was, as Trollope said, "a world in itself,—and the dustiest of all the worlds."⁶⁵ When all twelve of the city's elevators were operating at full capacity, Chicago could receive and ship nearly half a million bushels of grain every ten hours. The economic benefits of such efficient handling were so great that moving a bushel of grain from railroad car to lake

vessel cost only half a cent, giving Chicago a more than tenfold advantage over St. Louis.⁶⁶

These were great benefits to derive from the simple expedient of doing away with grain sacks, but they quickly raised a serious new problem that called into question the entire legal apparatus of the earlier grain-marketing system. Formerly, the transportation network had assiduously maintained the bond of ownership between shippers and the physical grain they shipped. Farmer Smith's wheat from Iowa would never be mixed with Farmer Jones's wheat from Illinois until some final customer purchased both. Now this started to change. As the scale of Chicago's grain trade grew, elevator operators began objecting to keeping small quantities of different owners' grain in separate bins that were only partially filled—for an unfilled bin represented underutilized capital. To avoid that disagreeable condition, they sought to mix grain in common bins. Crops from dozens of different farms could then mingle, and the reduced cost of handling would earn the elevator operator higher profits. The only obstacle to achieving this greater efficiency was the small matter of a shipper's traditional legal ownership of physical grain.

The organization that eventually solved this problem—albeit after several years of frustrated efforts and false starts—was the Chicago Board of Trade. Founded as a private membership organization in March 1848, the Board initially had eighty-two members drawn from a wide range of commercial occupations.⁶⁷ In the beginning, it had no special focus on the grain trade. Its principal goals were to monitor and promote the city's commercial activity, and to resolve any disputes that might arise among its members. Like boards of trade and chambers of commerce then emerging in other western cities, it sought to represent the collective voice of business interests in the city.⁶⁸ During the Board's first few years of existence, its members passed resolutions concerning canal tolls, telegraph services, harbor improvements, and other matters affecting the city's economy. Nonetheless, its accomplishments were few, partly because its real powers were limited. Its members could issue pronouncements, lobby politicians, and exercise moral suasion on other merchants. They could also agree among themselves that all Board members must follow certain business practices, with clearly prescribed penalties up to and including loss of Board membership. This internal regulatory mechanism soon emerged as the Board's most important power, enabling its members to regulate trade in Chicago by reaching collective consensus about their own best interests.

As in all voluntary organizations, members reached consensus most easily when their common interest was clear. The Board's earliest activities in the grain trade therefore focused on improving Chicago's inspec-

tion and measurement systems, since all legitimate traders had an interest in agreeing upon uniform weights and measures as a way of suppressing fraud. Elevators, with their automatic mechanisms for handling large quantities of grain in continuously moving streams, made the old measure of grain volume—a bushel of standard size—obsolete. Starting in 1854, therefore, the Board pressed city merchants to replace the old, volume-based bushel with a new, weight-based bushel that could be used to calibrate elevator scales.⁶⁹ The need for such a standard was indisputable, but members still argued about how much a bushel should weigh. In the early 1850s, Board meetings saw considerable controversy over how much a unit of shelled corn should weight in Chicago: some members wanted a standard bushel to weigh sixty pounds while others recommended fifty-six. In the absence of a clear consensus, both measures continued to be used for several years, with two separate sets of prices, until sixty-pound bushels emerged as the standard and did away with the confusion.⁷⁰

The trouble members had in agreeing about even so basic a standard as this suggests the Board's ineffectiveness during its first half decade. Throughout the early 1850s, it held annual meetings in borrowed rooms, issued pronouncements, and attracted few new members. Although its officers made continual efforts to hold daily meetings at which members could trade grain and other commodities at a single central location, they had great difficulty persuading anyone to come. The membership roll for a nine-day period in July 1851, for instance, reveals that only one member showed up on four of the days; no one at all was present on four others. Even the offer of free refreshments failed to increase attendance.⁷¹ Chicago's grain market continued to be as decentralized as ever, with traders conducting their transactions in offices, warehouses, and streets all around the city.

Not until European demand for grain expanded during the Crimean War did the fortunes of the Board begin to change. American wheat exports doubled in volume and tripled in value during 1853 and 1854, while domestic prices rose by more than 50 percent.⁷² The surge of foreign buying had impressive effects in Chicago. Between 1853 and 1856, the total amount of grain shipped from Chicago more than tripled, with 21 million bushels leaving the city in 1856 alone.⁷³ As volume increased and traders found it more convenient to do their business centrally, attendance at daily Board meetings rose. Rather than argue over prices amid heaps of grain in streets and warehouses, traders—usually working on commission for real owners and purchasers—brought samples to the Board's meeting rooms, dickered over prices, and arranged contracts among buyers and sellers. The greater the number of traders who gath-

ered in a single market, the more efficient and attractive that market became. By 1856, Board leaders felt confident enough of their organization's importance that they stopped serving cheese, crackers, and ale to encourage attendance. The advantages of the centralized market were soon so great that no serious grain merchant could afford not to belong, and so the Board began to issue membership cards that traders had to show to a doorkeeper before entering the meeting rooms. Daily meetings on the floor of what was beginning to be called 'Change (short for "Exchange") soon became so crowded that the Board moved to new quarters on the corner of LaSalle and South Water streets.⁷⁴

Its membership now numbering in the hundreds, the Board finally had sufficient influence to seek a new role: increasingly, its members would take it upon themselves to regulate the city's grain trade. By promulgating rules which all traders using its market agreed to follow, the Board in effect set uniform standards for the city as a whole, and for its grain-raising hinterland as well. Its system of regulations, proposed for the first time in 1856, restructured Chicago's market in a way that would forever transform the grain trade of the world. In that year, the Board made the momentous decision to designate three categories of wheat in the city—white winter wheat, red winter wheat, and spring wheat—and to set standards of quality for each.⁷⁵

In this seemingly trivial action lay the solution to the elevator operators' dilemma about mixing different owners' grain in single bins. As long as one treated a shipment of wheat or corn as if it possessed unique characteristics that distinguished it from all other lots of grain, mixing was impossible. But if instead a shipment represented a particular "grade" of grain, then there was no harm in mixing it with other grain of the same grade. Farmers and shippers delivered grain to a warehouse and got in return a receipt that they or anyone else could redeem at will. Anyone who gave the receipt back to the elevator got in return not the *original* lot of grain but an equal quantity of *equally graded* grain. A person who owned grain could conveniently sell it to a buyer simply by selling the elevator receipt, and as long as both agreed that they were exchanging equivalent quantities of *like* grain—rather than the physical grain that the seller had originally deposited in the elevator—both left happy at the end of the transaction. It was a momentous change: as one visitor to Chicago later remarked after a tour of one of the elevators, "It dawns on the observer's mind that one man's property is by no means kept separate from another man's."⁷⁶ The grading system allowed elevators to sever the link between ownership rights and physical grain, with a host of unanticipated consequences.⁷⁷

The Board's grading system was initially quite informal, each elevator

more or less setting its own rules for sorting grain into the new grades. Within two years, however, the Board had imposed much more formal grading regulations, for reasons that had to do with another problem that occurred when grain from different owners mixed together in single bins. Farmers had been complaining for years that prices paid in Chicago markets did not adequately reflect differences in quality among different shipments of grain.⁷⁸ One correspondent of the Chicago-based *Prairie Farmer* in 1852 told of an instance in which four farmers arrived in the city, one with sprouted wheat, one with dirty wheat, one with good wheat that had been intentionally mixed with dirt and chaff, and one with good clean wheat of prime quality. Despite such wide variations in the real value of what they had to sell, all four received from forty-seven to fifty cents per bushel—because elevator operators had no reliable way to grade and separate grains of different quality as they entered the warehouse. Under such circumstances, farmers had little incentive to keep their grain clean, and so Chicago's grain had developed a reputation among eastern buyers for being particularly dirty and bad. Indeed, as the third farmer had discovered, one could sometimes make grain more valuable by mixing it with cheaper substances—not all of them palatable—to increase its weight and hence its price. The *Prairie Farmer*'s correspondent concluded, "There is no wonder then, that our wheat should be thought so little of in Eastern markets."⁷⁹

Dirty, mixed, and generally low-quality grain became a growing problem during the nationwide depression that began in 1857. As farmers struggled to earn adequate incomes in the wake of collapsing grain prices—spring wheat fell by more than half from the beginning of 1856 to the end of 1857—they either did not bother to clean their wheat thoroughly or mixed it with lower-priced materials like oats, rye, and chaff to increase its weight and hence its value at the elevator scales.⁸⁰ "We are credibly informed, and believe," reported a committee of the Board of Trade in 1858, "that it is a common occurrence, for farmers to send damp and dirty grain to this market, calculating that under the present system of inspection it will bring about as much as it would if it were thoroughly cleaned and in good order. . . ."⁸¹ Grain merchants in the city found that they were having more trouble than usual selling wheat identified as coming from the Chicago market. They got better prices by claiming, falsely, that they were selling "Milwaukee Club"—the best grain from Wisconsin, which brought five to eight cents more per bushel in New York than did "Chicago Spring"—with the result, according to one newspaper report, that western merchants appeared to be selling four times more Milwaukee Club to New York than farmers had actually raised in Wisconsin.⁸²

Worried that such reports would soon hurt their market, members of the Board of Trade adopted a series of reforms between 1857 and 1859 designed to improve the reputation of Chicago grain. The key step was to make formal distinctions between grains of different quality. Starting in 1857, the Board no longer recognized "spring wheat" as a single category, but instead broke it into three grades ranked from high quality to low: "Club Spring," "No. 1 spring," and "No. 2 spring."⁸³ Even these proved inadequate, for in 1858 a Board committee announced that "to improve the character of our grain it will be necessary hereafter to reject entirely much of the grain that has heretofore passed as standard in this market."⁸⁴ Board members therefore added a fourth category—"Rejected"—to define the bottom of the scale.

The Board adopted comparable grades for corn, oats, rye, and barley, but the greater value of wheat meant that its grading scale became more complicated than the others as traders struggled to devise a standardized system that could adequately distinguish among wheat shipments of different quality. Over the next several years, grading scales became ever more elaborate; by 1860, there were no fewer than ten different grades for wheat alone. Distinctions among grades inevitably depended to a considerable degree on subjective judgment: No. 1 white winter, for instance, required that the berry "be plump, well cleaned and free from other grains," while No. 2 white winter was "sound, but not clean enough for No. 1."⁸⁵ There was plenty of room for disagreement in these standards, but grades and the measures of quality they reflected—plumpness, purity, cleanliness, and weight—quickly became more and more clearly defined. The best grain was plumper, purer, cleaner, drier, and heavier than its competitors.

To make sure that the city's elevators applied these grades consistently in filling their bins, Board members in 1857 for the first time resolved to appoint an official "grain inspector of the city at large" who would be "competent and a good judge of the qualities of the different kinds of grain."⁸⁶ In 1860, after a brief unsuccessful period of working with inspectors employed by the elevators, the chief inspector was ordered to hire and train a committee of assistants who, for a standard fee, would examine grain shipments and certify the grade of any elevator receipt traded on the floor of 'Change.⁸⁷ To enable inspectors to do their work, the Board got the city's elevator operators to agree (not altogether enthusiastically) that they would allow inspectors to enter warehouses to make sure that the grain in individual bins was actually of the grade that the elevator claimed it to be. This last step was crucial, for only thus could the Board guarantee that people purchasing elevator receipts in its meeting rooms would receive grain of the designated quality when they went

to reclaim their shipments. Inspection underpinned the integrity of the grading system, which underpinned the integrity of the elevators, which underpinned the integrity of the Board's own markets.

The Board's inspection system was not without fraud, and over the years it came under repeated attack by people who worried that inspectors might be winking at corrupt practices. But since the Board's members included just as many buyers as sellers—most members regularly operated on both sides of the market—the organization as a whole had a clear interest in honest grading. Even critics of the system acknowledged this. "That there are advantages in a well arranged and equitable grading system," observed the editors of the *Prairie Farmer* in 1861, "no one can deny—it is an incentive to send good and merchantable well cleaned grain to market. It facilitates the handling of the large amounts of grain that find their way to this market, and without which it would be difficult to do it."⁸⁸ The Board's inspectors might not always be competent, and they might not always detect the frauds that could be perpetrated in elevator bins. Everyone recognized "the great importance of placing men of character and sound judgment in these important positions."⁸⁹ Individual inspectors undoubtedly engaged in dishonest practices from time to time, but the Board of Trade as a whole had no structural reason to bias inspections in one direction or another. Quite the contrary: all honest members benefited from knowing exactly what they were buying and selling.

The Board's right to impose standardized grades and inspection rules on its members—and hence on the Chicago market as a whole—was written into Illinois law in 1859, when the state legislature granted the organization a special charter as "a body politic and corporate."⁹⁰ Under its terms, the Board gained the right to hire inspectors and measurers whose judgments about grain quality would be legally binding on Board members, who by now included among their number most grain traders in Chicago. If a dispute arose between members about whether someone had failed to fulfill a trading contract, a Board committee had the power to arbitrate between them. Remarkably, the charter declared that once the committee had rendered its decision, the ruling would have the same legal force "as if it were a judgment rendered in the Circuit Court." New members joining the organization were required to swear an oath—with the full force of binding contract behind it—that they would obey the Board's rules, regulations, and bylaws, in effect abandoning much of their right of appeal to the civil courts. The effect of the charter was that the Chicago Board of Trade—a private membership organization of grain merchants—became a quasi-judicial entity with substantial legal powers to regulate the city's trade.⁹¹

Futures

By 1859, then, Chicago had acquired the three key institutions that defined the future of its grain trade: the elevator warehouse, the grading system, and, linking them, the privately regulated central market governed by the Board of Trade. Together, they constituted a revolution. As Henry Crosby Emery, one of the nineteenth century's leading scholars of commodity markets, wrote in 1896, "the development of the system of grading and of elevator receipts is the most important step in the history of the grain trade."⁹² The changes in Chicago's markets suddenly made it possible for people to buy and sell grain not as the physical product of human labor on a particular tract of prairie earth but as an abstract claim on the golden stream flowing through the city's elevators.

Chicagoans began to discover that a grain elevator had much in common with a bank—albeit a bank that paid no interest to its depositors. Farmers or shippers took their wheat or corn to an elevator operator as if they were taking gold or silver to a banker. After depositing the grain in a bin, the original owner accepted a receipt that could be redeemed for grain in much the same way that a check or banknote could be redeemed for precious metal. Again as with a bank, as long as people were confident that the elevator contained plenty of grain, they did not need to cash the receipt to make it useful. Because the flow of grain through the Chicago elevators was enormous, one could almost always count on them to contain enough grain to "back up" one's receipt: the volume of the city's trade in effect made receipts interchangeable. Instead of completing a sale by redeeming the receipt and turning over the physical grain to a purchaser, the original owner could simply turn over the receipt itself. The entire transaction could be completed—and repeated dozens of times—without a single kernel of wheat or corn moving so much as an inch. The elevators effectively created a new form of money, secured not by gold but by grain. Elevator receipts, as traded on the floor of 'Change, accomplished the transmutation of one of humanity's oldest foods, obscuring its physical identity and displacing it into the symbolic world of capital.⁹³

The elevator helped turn grain into capital by obscuring and distancing its link with physical nature, while another new technology extended that process by weakening its link with geography. In 1848, the same year that Chicago merchants founded the Board of Trade, the first telegraph lines reached the city. The earliest messages from New York had to be relayed through Detroit and took some eighteen hours to arrive, but that

seemed nearly instantaneous compared with the days or weeks such messages had taken before.⁹⁴ As the telegraph system expanded across the nation and became more efficient, hours became seconds. By the Civil War, there were 56,000 miles of telegraph wire throughout the country, annually carrying some five million messages with lightning speed.⁹⁵

Because commodity prices were among the most important bits of information that traveled the wires, the coming of the telegraph meant that eastern and western markets began to move in tandem much more than before.⁹⁶ As a result, those with the best access to telegraph news were often in the best position to gauge future movements of prices. The *Chicago Democrat* in September 1848 related the story of a Chicagoan who had raced down to the docks after receiving word from the telegraph office that wheat prices were rising on the East Coast. "Seeking among the holders of Illinois wheat, whom he might make a meal of," he

soon came across his man, and immediately struck a bargain for a cargo at eighty cents per bushel, the seller chuckling over his trade. In less than fifteen minutes, however, the market rose to eighty-five, and the fortunate possessor of the news by the last flash pocketed the cool five hundred.⁹⁷

Although telegraphic information created speculative opportunities of this sort, it also increased the efficiency of regional markets by giving traders throughout the country speedier access to the same news. To the extent that local price differences reflected uncertainty about conditions in other markets—uncertainty of the sort John Burrows had experienced when he launched his unlucky boatload of potatoes down the Mississippi—the telegraph brought prices in distant places closer together by reducing the chance that people would act on bad information. In the wake of the telegraph, news of western harvests brought instant shifts in New York markets, while news of European wars or grain shortages just as rapidly changed prices in Chicago. Local events—a drought, say, or an early frost—ceased to be so important in setting prices for grain or other crops. If local circumstances forced up prices at one place, the telegraph allowed knowledgeable buyers to go elsewhere, driving local prices back down. As markets became more efficient, their prices discounted local conditions and converged with regional, national, and even international price levels. The wider the telegraph's net became, the more it unified previously isolated economies. The result was a new market geography that had less to do with the soils or climate of a given locality than with the prices and information flows of the economy as a whole.⁹⁸

As part of its new landscape of information, the telegraph helped focus attention on cities that already had large trade volumes. A farmer in

Iowa inevitably wanted to know wheat prices in Chicago, just as a banker in Chicago wanted to know interest rates in New York. Although the telegraph dispersed price information across an ever widening geographical field, it also concentrated the sources of such information in a few key markets. The dense flow of news in cities like Chicago and New York allowed their prices to reflect trade conditions not just for the local economy but for the national and even the global economy. Once such central markets had become established, people in other places looked to New York and Chicago prices before all others, enhancing the significance and geographical reach of those two cities in a kind of self-fulfilling prophecy.

The new communication technology had much to do with making the Chicago Board of Trade one of the key grain markets in the world by the late 1850s. The Board began regularly posting telegraph messages from New York in 1858, and the Chicago newspapers started carrying daily market reports from New York, Buffalo, Oswego, and Montreal shortly thereafter. When Board members moved into their new Exchange Hall in 1860, they made sure that a telegraph office occupied the western end of the trading room.⁹⁹ The same new emphasis on telegraphic information occurred in New York as well, where the New York Stock Exchange rose to prominence as the national market for securities during the same period and in much the same way.¹⁰⁰ News of events in these emerging central markets flashed outward along the wires and helped set prices wherever it went. One eastern traveler in 1851 remarked after seeing a telegraph line crossing the Mississippi River,

It seemed like the nervous system of the nation, conveying, quick as thought, the least sensation from extremity to head, the least volition from head to extremity. . . . Or, like a vast arterial system, it carries the pulsations of the heart to the farthest extremity; and by these wires stretched across the Mississippi, I could hear the sharp, quick beating of the great heart of New York.¹⁰¹

But the very speed of that heartbeat's spreading rhythm created a problem: although prices might travel from New York to Chicago and back again in a matter of minutes or seconds, grain could hardly do the same. Bushels of wheat or corn still took days or weeks to complete their eastward journey. Since everything depended on buyers' being able to examine grain before they offered a price for it, at least part of the shipment had to reach its destination before parties to the sale could reach an agreement. The old grain-marketing system had solved this difficulty by sending forward a small express sample of the larger shipment, allowing eastern buyers to make their purchases before the bulk of the grain ar-

rived. But there was no way in which even small samples could move quickly enough to lock in the prices coming over telegraph wires. By the time a sample or shipment reached its eastern destination so that buyers could make an offer after examining it, prices might already have changed drastically. Neither buyers nor sellers were happy about the risks such delayed transactions entailed.

Fortunately for both parties, there was a way around this dilemma. If buyers and sellers could complete their grain transactions by telegraph, they could escape the risk and uncertainty of a fluctuating market. However much prices might change in the future, merchants and millers could know that they would receive their grain at the price they expected. The means to this happy end were already available from the same institution that had resolved the elevators' problem of mixing grain in common bins. When the Board of Trade adopted a standard grading system, it made grain interchangeable not just between elevator bins but between cities and continents as well. Once people inside and outside Chicago began to know and trust the Board's new grades, a New York grain dealer could purchase five thousand bushels of Chicago No. 2 spring wheat solely on the basis of prices quoted over the telegraph lines. No longer was it necessary to see a sample of any particular shipment, for all grain of a given grade was for practical purposes identical. A New Yorker could simply check telegraph quotations from the floor of 'Change and wire back an order when the price seemed right, without having to examine a sample of the grain in advance.

Telegraphic orders of this sort encouraged a sharp rise in what traders called "to arrive" contracts for grain. Under these contracts, a seller promised to deliver grain to its buyer by some specified date in the future. Like the telegraph, "to arrive" contracts significantly diminished the risks of trading grain. With the advent of standard grades, it became possible to sell grain to its final customer before it actually began its journey east. A western seller could sign a contract agreeing to deliver grain to an eastern buyer at a specified price within thirty days or some other period of time. With the sale thus guaranteed, most of the *time*-related risks of grain storage or transportation disappeared: had John Burrows been able to use the telegraph to contract in advance for delivering his boatload of potatoes in New Orleans, his journey would have had a much happier ending.¹⁰² Moreover, banks were willing to offer loans to farmers and shippers on the basis of such contracts, so commission merchants found their credit requirements significantly reduced. Customers no longer needed to borrow from commission merchants, but could get immediate cash by using their "to arrive" contracts and elevator receipts as security for bank loans.¹⁰³ Such "to arrive" contracts were an old legal form that

had been in use on a small scale at Buffalo, Chicago, and other grain-trading cities since the 1840s, but the telegraph and the grading system gave them unprecedented popularity.¹⁰⁴

"To arrive" contracts in combination with standardized elevator receipts made possible Chicago's greatest innovation in the grain trade: the futures market.¹⁰⁵ "To arrive" contracts solved a problem for grain shippers by ending their uncertainty about future price changes; at the same time, they opened up new opportunities for speculators who were willing to absorb the risk of price uncertainty themselves. If one was willing to gamble on the direction of future price movements, one could make a "to arrive" contract for grain one did not yet own, since one could always buy grain from an elevator to meet the contract just before it fell due. This is exactly what speculators did. Contracting to sell grain one didn't yet own—"selling short"—enabled one to gamble that the price of grain when the contract fell due would be lower than the contract's purchaser was legally bound to pay. By promising to deliver ten thousand bushels of wheat at seventy cents a bushel by the end of June, for instance, one could make \$500 if the price of wheat was actually only sixty-five cents at that time, since the buyer had contracted to pay seventy cents whatever the market price. When June came to an end, one had only to buy the necessary number of elevator receipts at their current price on the Chicago Board of Trade, and use them to fulfill the terms of the contract. Given the enormous volume of elevator receipts in circulation, there was little reason to fear that grain would not be available when the "to arrive" contract fell due.

It is impossible to fix the earliest date at which a full-fledged futures market existed in Chicago. The city's newspapers commented on the frequency of sales for future delivery as early as the Crimean War (1853–56).¹⁰⁶ Such sales, however, were often "to arrive" contracts which speculators secured by borrowing elevator receipts from actual holders of grain, and so (unlike true futures contracts) were limited in scale by the number of receipts in circulation.¹⁰⁷ During the Civil War, the Union army's demand for oats and pork generated a huge speculative market in those commodities, which finally helped institutionalize futures trading as a standard feature of the Chicago Board of Trade. It was no accident that the Board adopted its first formal rules governing futures contracts in 1865.¹⁰⁸

At whatever point we choose to locate its origins, a new sort of grain market had emerged at the Chicago Board of Trade by the second half of the 1860s. Alongside the older, more familiar market, in which traders bought and sold elevator receipts for grain actually present in the city, there was a growing market in contracts for the *future* delivery of grain

that perhaps did not even exist yet. These new contracts represented a departure from the older grain market in several key ways. As defined by the Board's bylaws, they referred not to actual physical grain but to fixed quantities of standardized *grades* of grain. They called for delivery not at the moment the contract was struck but at a future date and time that was also standardized by the Board's rules. The contract, in other words, followed a rigidly predefined form, so that, as Henry Emery noted, "only the determination of the total amount and the price is left open to the contracting parties."¹⁰⁹ This meant that futures contracts—like the elevator receipts on which they depended—were essentially interchangeable, and could be bought and sold quite independently of the physical grain that might or might not be moving through the city.

Moreover, the seller of such a contract did not necessarily even have to deliver grain on the day it fell due. As long as the buyer was willing, the two could settle their transaction by simply exchanging the difference between the grain's contracted price and its market price when the contract expired. Imagine, for instance, that Jones sold Smith a futures contract for 10,000 bushels of No. 2 spring wheat at 70 cents a bushel, to be delivered at the end of June. If that grade was in fact selling for 68 cents a bushel on June 30, Jones could either purchase 10,000 bushels at the lower price and deliver the receipts to Smith or—more conveniently still—accept a cash payment of \$200 from Smith to make up the difference between the contract price and the market price. Had the wheat cost 72 cents on June 30, on the other hand, Jones would have paid Smith the \$200.¹¹⁰

In either case, Jones and Smith could complete their transaction without any grain ever changing hands. Although those who sold futures contracts were legally bound to deliver grain if requested to do so, in practice they rarely had to. As the historian Morton Rothstein has aptly put it, the futures market, when viewed in the most cynical terms, was a place where "men who don't own something are selling that something to men who don't really want it."¹¹¹ Resolving this apparent paradox reveals the extent to which the Chicago grain market had distanced itself from the agricultural world around it. The futures market was a market not in grain but in the *price* of grain. By entering into futures contracts, one bought and sold not wheat or corn or oats but the *prices* of those goods as they would exist at a future time. Speculators made and lost money by selling each other legally binding forecasts of how much grain prices would rise or fall.

As the futures market emerged in the years following the Civil War, speculative interests dominated more and more of the trading on the floor of 'Change. On either side of any given futures contract stood two

figures, metaphorically known to traders and the public alike as the bull and the bear.¹¹² Bulls, believing that the trend of grain prices was upward, tended to *buy* futures contracts in the hope that they would be cheaper than the market price of grain by the time they fell due. Bears, on the other hand, believing that the trend of prices was downward, tended to *sell* futures contracts in the hope that they would be more expensive than the market price of grain when they expired. Except under certain special circumstances, neither bulls nor bears cared much about actually owning grain.¹¹³ One was "long" while the other was "short," and each needed the other to make the market in future prices possible. Since both were gambling that the predictions of the other were wrong, the gains of one always matched the losses of the other. From the point of view of the traders, it mattered little whether the actual price of grain rose or fell, whether farm crops were good or bad, except insofar as these things corroborated price predictions and thereby determined which speculative animal won or lost.

Grain elevators and grading systems had helped transmute wheat and corn into monetary abstractions, but the futures contract extended the abstraction by liberating the grain trade itself from the very process which had once defined it: the exchange of physical grain. In theory, one could buy, sell, and settle up price differences without ever worrying about whether anything really existed to back up contracts which purported to be promises for future delivery of grain. One proof of this was the speed with which futures trading surpassed cash trading—the buying and selling of actual grain—at the Chicago Board of Trade. Although no one kept accurate statistics comparing the two markets, the *Chicago Tribune* estimated in 1875 that the city's cash grain business amounted to about \$200 million; the trade in futures, on the other hand, was ten times greater, with a volume of \$2 billion.¹¹⁴ A decade later, the Chicago futures market had grown to the point that its volume was probably fifteen to twenty times greater than the city's trade in physical grain.¹¹⁵ That the trade in not-yet-existing future grain far surpassed the number of bushels actually passing through the city's elevators was strong evidence that Chicago speculators were buying and selling not wheat or corn but pieces of paper whose symbolic relationship to wheat or corn was tenuous at best.

And yet however tenuous that relationship might have become, it could never finally disappear, for one simple reason. No futures contract ever overtly stated that it could be canceled by settling the difference between its price and the market price for grain on a given day.¹¹⁶ Although the practice of "settling differences" became exceedingly common, written contracts—which after all were enforceable in a court of law—stated that grain would be delivered on the day they expired. Since

futures contracts rapidly came to have standardized expiration dates—usually the last day of certain months—the market in future prices and the market in real grain had to intersect each other at regular intervals. On the day a futures contract expired, prices in the cash grain market determined its value. Because they did so, the activities of speculators working the floor of ‘Change sooner or later circled back to those of farmers working the black prairie soil of the western countryside. Remote as the two groups often seemed from each other, they were linked by the forces of a single market.

Never was this clearer than when a group of speculators, working in unison, succeeded in “cornering” one of Chicago’s grain markets, an event that became increasingly common in the decades following the Civil War. To accomplish this feat, a group of grain traders (invariably bulls) began quietly buying up futures contracts for a particular date, usually just prior to a new harvest, when supplies were at their lowest.¹¹⁷ At the same time, they bought up physical (“spot” or “cash”) grain as well, in the hope that they could control most of the city’s supply by the time futures contracts fell due. Since their ultimate plan was to manipulate the market to trap unwary bear speculators who had sold grain for future delivery, their purchases had to be as invisible as possible, lest other traders refuse to sell. For this reason, corners often seemed mysterious events, emerging suddenly and taking traders by surprise without anyone’s being quite certain who had set the trap.

The logic of a corner lay in forcing speculators to deliver real physical grain instead of following their usual practice of settling price differences. If a bear speculator could not make delivery as a contract promised, because the operators of the corner owned all available grain, the seller had no choice but to fulfill the contract by purchasing grain from the cornerers themselves, usually at exorbitant prices. The operators of a corner could name virtually any price, for the futures contract had the full penalties of civil law supporting it. Those who failed to deliver on their legal promise placed their businesses and reputations in jeopardy, and could even face bankruptcy or jail. The sums of money that might change hands under such circumstances were enormous, running into thousands and finally millions of dollars. A cornered market was a painful and expensive reminder that elevator receipts and paper contracts were ultimately backed by real grain.

The futures market came to fruition in the years immediately following the Civil War, and so did the corner.¹¹⁸ Alfred Andreas, Chicago’s leading nineteenth-century historian, remembered 1868 as “the year of corners.” “Scarcely a month” went by, he wrote, “without a corner on ‘Change. Three on wheat, two on corn, one on oats, and one attempted

on rye. . . ."¹¹⁹ Among the most successful was one which can serve as an example of the whole phenomenon: the corner on No. 2 spring wheat run during the month of June.¹²⁰ In late May and early June, a syndicate led by the grain traders John Lyon of Chicago and Angus Smith of Milwaukee gradually bought futures contracts for nearly a million bushels, to be delivered on June 30.¹²¹ By June 24, as traders began to realize they were being squeezed in a corner, the *Tribune* market report declared, "The feeling has been growing for some time past that ruling prices are unnatural. . . . Wheat being held off the market by parties able to control it, the price goes up or down as they turn the screws on more tightly or relax them a little. . . ."¹²² On June 30, when the cornered contracts finally fell due, No. 2 spring wheat sold for \$2.20 per bushel in Chicago, twenty cents more than the same grain selling in New York. Since it cost at least forty cents a bushel to move wheat between the two cities, this meant that the corner had driven Chicago prices at least sixty cents above their normal level.¹²³

As the *Tribune* reported, proof that the Lyon-Smith syndicate had successfully cornered the market came the instant June futures contracts expired:

Five minutes before 3 o'clock yesterday afternoon wheat sold readily in Chicago at \$2.20 per bushel. Five minutes after 3 o'clock it was freely offered at \$1.85, but no one wanted it, and no one bought a grain. The difference of 35 cents per bushel . . . [was] a natural sequel to the "corner."¹²⁴

For individual speculators, most of whom had sold their futures contracts at \$1.80 to \$1.90 per bushel, the consequences of the corner were painful indeed. They could fulfill a standard contract for 5,000 bushels at the end of the month only by purchasing grain from the corner's operators, at a loss of perhaps \$1,250 per contract. In the June 1868 corner, the operators' average gain was about twenty-five cents per bushel on 875,000 bushels, producing a gross income of nearly \$220,000.¹²⁵ The *Tribune's* market report suggested that some small traders had "probably lost their all—the accumulations of long years of toil—and have received a valuable lesson almost too late to profit by it."¹²⁶ Alfred Andreas explained the lesson more explicitly: however remote the futures market might seem from the movement of real grain, "there was an actual basis of property underneath every trade; and . . . to sell what one did not possess was fraught with as much danger as to buy what one could not pay for."¹²⁷

Who suffered from a successful corner? First and foremost, the bear speculators who had been forced to redeem futures contracts at inflated

prices; in this sense, the corner was just a transfer of wealth from one group of grain traders to another. Although large speculators were by no means immune to being trapped in a corner, many of those who lost most heavily were probably smaller traders who were less in touch with day-to-day activities in the Chicago market: country grain dealers placing orders through Chicago traders, for instance, or speculators "of small means" who, "tempted by the golden offers of commission men, order them to buy or sell short, and pay a small percentage for the trouble."¹²⁸ Those who did not speculate were much less directly affected. The few farmers who still had spring wheat to sell benefited temporarily from higher prices in Chicago markets; and because the grain purchased during the corner never commanded such high prices when it finally reached New York, eastern consumers probably experienced little increase in the price of bread as a result.¹²⁹

But the effects of the corner were not limited to the speculators who had participated in it. Its most obvious consequence was to distort the Chicago wheat market for an extended period of time both during and after the corner. By the last week in June, No. 2 spring wheat was actually selling at a higher price than the better-quality No. 1 spring wheat (which was not cornered); sales of the latter virtually halted after desperate bears bought the better wheat and had it graded down to try to meet their contracts.¹³⁰ Fewer and fewer wheat sales of any kind occurred as the end of the month approached, until June 30 itself, when nearly a quarter of a million bushels changed hands as trapped speculators closed out their contracts.

The next day, the *Tribune* reported that the wheat market had collapsed: "there were no transactions, or so few that the market was the dullest within the memory of the oldest inhabitant."¹³¹ This too was a predictable consequence of the earlier market manipulations. The classic problem of running a corner was bringing it to a successful close. Even if one had made enormous profits when cornered futures contracts expired, one still faced the difficult task of selling off the vast stockpile of grain one had acquired to make the corner possible in the first place. Keeping the grain in store cost money, but putting it up for sale inevitably caused prices to decline, sometimes precipitously. If the bulls who had cornered the market did not have time to sell off their grain before prices fell below the level at which they had originally purchased it, they ran the serious risk of losing all their profits from the earlier transactions. The bears might get their revenge after all. In the parlance of the day, the cornered wheat was "an elephant which it is equally difficult to keep as to get rid of safely."¹³² Later in the century, speculators told of how hard it was to "bury the corpse" when the corner was done.

In 1868, other traders knew that the speculators who had run the corner would have to dispose of their grain, and also feared that the Lyon-Smith syndicate might be in a position to repeat its performance in July.¹³³ Because uncertainty about the future direction of local wheat prices was so great, traders were "skeery," and refused either to buy or to sell until the direction of the market became clearer. "It is well known," wrote the *Tribune's* reporter, that the corner's operators "have a large amount on hand, which may be thrown on the market at any time and swamp it. This destroys the desire to buy, while sellers are equally scarce. . . ."¹³⁴ As the stagnant market dragged on into the middle of the month, speculators who had earlier contracted to deliver wheat at the end of July started to fear that they might be caught in a corner again, and they therefore purchased grain from other cities to be able to make delivery on time. The bizarre result was that wheat began to be shipped south to Chicago from Racine, Wisconsin, "at a cost nearly equal to that required to carry it from Chicago to Buffalo," even though Chicago continued to have large quantities of wheat in store.¹³⁵ Wheat prices remained higher in Chicago than in nearby markets—Milwaukee's No. 1 spring wheat was cheaper than Chicago's No. 2—so millers and other large consumers of grain simply stopped buying from the city.¹³⁶

This state of affairs persisted until the end of July, with only a few thousand bushels of wheat changing hands each day in a market accustomed to handling ten times that quantity. Traders lamented that "the rushing torrent of last month had become a peaceful gully, without a stream."¹³⁷ Farmers and merchants whose railroad connections to Chicago made them dependent on the Board of Trade had trouble getting any price at all for their grain. In Chicago itself, grain traders grew angry about the disruption of their ordinary business. By the end of the month, the *Tribune*, which had initially held itself aloof from commenting on the shenanigans at the Board, issued a stern indictment of the whole business:

If anything more sick than the wheat market of the present time can be invented, we do not want to see it, and if the members of the late combination can take pleasure in viewing the demoralization they have wrought, they are exceptions to the ordinary run of human nature. The Corner was as disastrous in its influence on the wheat trade, as a long continued strike is to the business of a city. It has completely upset the order of things, kept the cereal from the city, driven operators away, and forced millers to buy elsewhere. The chances are that the exhaustion will not be recovered from in many months, though . . . the arrival of New Wheat will surely produce some current, though a small one, in this hitherto important channel of trade.¹³⁸

Corners, in short, seemed to call into question the legitimacy of the entire futures market.

The market finally did become more active in August after traders realized that the syndicate had apparently failed (or perhaps had not even tried) to corner July wheat.¹³⁹ Just when everyone had begun to feel more comfortable, however, an equally severe corner in September corn squeezed many bear speculators so badly that some of the most prominent trading houses in the city found themselves hard pressed to honor their commitments. Even E. V. Robbins, president of the Board of Trade, became so financially embarrassed in the September corner that he felt obliged to tender his resignation to the Board's directors. They refused to accept it, on the grounds that he was an honorable man who had been caught out through no fault of his own. Instead, they castigated the corner operators themselves. On October 13, Board members passed a resolution that

the practice of "corners," of making contracts for the purchase of a commodity, and then taking measures to render it impossible for the seller to fill his contract, for the purpose of extorting money from him, has been too long tolerated by this and other commercial bodies in the country to the injury and discredit of legitimate commerce, [and] that these transactions are essentially improper and fraudulent. . . .¹⁴⁰

To put teeth in this resolution, members amended the Board's bylaws so that traders could appeal to a disinterested panel if they felt they had been cornered. The panel had the formal power to recognize the existence of a corner, and then to break it by allowing cornered bears to use nonstandard grades of grain in paying off their futures contracts. In addition, the Board could suspend the membership of anyone who tried to run a corner.¹⁴¹

If the purpose of the new rule was to put an end to corners, it failed. The Board's directors proved reluctant to enforce the anticorner regulations, and corners continued unabated to the end of the century and beyond. They became if anything more spectacular with time, the most famous being the Leiter corner of 1896, which Frank Norris immortalized in his novel *The Pit*.¹⁴² Although members sometimes invoked Board rules to try to close out corners once they had been run, few grain traders expected corners to disappear altogether.¹⁴³ Indeed, their emotions about corners were an odd mixture of fear and admiration. A corner operator was a gambler's gambler. Whether one saw such people as heroes or as villains, one still had to admire their daring: tales of great corners and their operators became the stuff of Board legend.¹⁴⁴

More important, few traders were willing to attack a phenomenon that seemed to flow from the heart of the market itself. Chicago's great innovation in the grain trade had been to simplify the natural diversity of wheat, corn, and other crops so that people could buy and sell them as homogeneous abstractions. To accomplish that task, the Board of Trade had drawn artificial boundaries to separate one abstract category of grain from another: spring wheat from winter wheat, No. 1 wheat from No. 2 wheat, and so on. Without those boundaries, neither futures nor corners would have been possible on any large scale. The futures contract depended on buyers and sellers not having to worry about evaluating the quality of the grain they were trading, especially since that grain often did not yet exist at the moment they bought and sold it. Standard grades eliminated such worries, but they also segmented the market so that grain of one grade could not legally be used to fulfill contracts for grain of another. With the market divided up in this way, speculators found it possible to buy up all rights to future grain of a particular grade. By institutionalizing the contractual boundaries which prevented traders from exchanging grains of different grades, the Board created the essential condition that made corners possible.¹⁴⁵ Because that condition was no less essential to the "legitimate" grain-trading apparatus of Chicago, the Board could hardly afford to attack the corner problem at its root. Corners were an almost inevitable result not just of the futures contract but of grain grading and elevators as well; all three derived from the same artificial partitioning of the economic landscape, the same second nature.

Boundary Disputes

Outsiders were much less prepared than traders to accept this newly partitioned market as natural or inevitable, and even Board members were uncomfortable with some of the changes going on around them. The late 1860s saw widespread agitation throughout Illinois for legislation to regulate what many farmers and merchants regarded as a long list of abuses in the Chicago marketplace. In that list, corners were only the most dramatic sign that railroads, elevators, standard grades, and futures contracts had imposed a new order on Chicago's grain markets. Although the complaints took many forms, most came down to the same fundamental problem: how to draw appropriate boundaries around the products of rural nature, and who should benefit from those boundaries. Despite the deep suspicion that many rural residents felt toward the Board of Trade and its mysterious market, farmers and Board members often found themselves on the same side of arguments about how to reform Chicago's

grain trade. Moreover, they had a common enemy: the grain elevator operators.

The Board's new grading system, of course, touched farmers as much as traders. Each time a farmer delivered grain to an elevator and had it graded by one of the Board's inspectors, its market value depended on the particular grade it received. In 1860, the Board defined No. 1 spring wheat as weighing more than 59 pounds per bushel, while No. 2 spring wheat weighed from 56 to 59 pounds. Any spring wheat weighing less than 56 pounds was labeled Rejected; it still had a market, but brought a much lower price. Although the weight of real physical wheat varied continuously along this scale from No. 1 to No. 2 to rejected, the inspection system's boundaries defined how much farmers or merchants actually received when they finally sold their grain. Whether wheat weighed an ounce more or less than 56 pounds might make a difference of ten cents or more per bushel in its price. If a family raised 500 bushels of wheat, its income could rise or fall by more than 10 percent—\$50 if the price was \$1.00 per bushel—depending on which side of the grade boundary its grain happened to be placed.¹⁴⁶

Because grade boundaries might mean the difference between profit or loss for a family's annual crop, arguments about inspection and grading were almost unavoidable. This was especially true when grade prices differed markedly. In the words of one country dealer, "the wider the difference between the different grades *in price*, the more particular will be the grading. . . ."¹⁴⁷ As graders drew sharper boundaries between grain shipments that seemed nearly identical, disputes about grading grew more frequent. Sometimes complaints reflected a farmer's or merchant's unwillingness to accept the true value of a shipment; sometimes they reflected an inspector's unfair grading; but always they reflected a dispute over how to impose artificial boundaries on the world of "natural" grain.

Disputes about grade boundaries manifested themselves as complaints about elevator fraud, which became a major political grievance of Illinois farmers and grain traders during the 1860s and 1870s. Many such complaints were well justified. Grain inspectors were sometimes dishonest, classifying a farmer's or trader's shipment into a lower grade than it actually deserved and giving someone else—usually the elevator operator—the resulting difference in value. Elevators on occasion set their scales to underweigh an entire shipment and thereby lower its grade.¹⁴⁸ One reason the Board hired its own team of inspectors in 1860 was to reduce the likelihood of such fraud, for Board members had as strong an interest as farmers in properly graded grain. Stories nonetheless circulated of farmers who had sent two carloads of identical grain to Chi-

cago, one of which was then graded No. 1 and the other Rejected, with a resulting ten- to fifteen-cent difference in price per bushel.¹⁴⁹ The Board did not deny that such things could happen, but argued that they were much more the exception than the rule: "while general charges of a very indefinite [*sic*] character have frequently been made against [the inspectors'] decisions, by parties in interest," one Board report declared, "nothing has ever been established that would indicate they were wanting in either honesty or ability."¹⁵⁰ Reassuring declarations of this sort proved unpersuasive to farmers, for it did not take much anecdotal evidence to confirm rural suspicions that the entire Chicago market was corrupt. Farmers "knew" that railroads, elevators, inspectors, and "grain gamblers" were all in league to swindle the defenseless producer.¹⁵¹

But not all conflicts over grade boundaries signified obvious fraud. The grading system itself could structurally favor one group of traders over another simply by the number of grades it contained. The fewer standard grades there were, the more possible it was for buyers to benefit at the expense of sellers from variations in the true value of physical grain *within* any particular grade.¹⁵² To take advantage of such variation, a buyer or an elevator operator had only to mix grain from different grades. If one farmer sold 1,000 bushels of No. 2 wheat weighing 59 pounds, and another sold 1,000 bushels of Rejected wheat weighing 55 pounds, an elevator could combine the two lots and instantly produce 2,000 bushels of No. 2 wheat weighing 57 pounds. If the price differential between the grades was ten cents, the simple act of mixing yielded a profit to the elevator of \$100.¹⁵³

Farmers naturally believed that this \$100 had been stolen from them, but the nature of the theft was difficult to define.¹⁵⁴ No elevator could operate without mixing at least the grain *within* a given grade, and the opportunity for making a profit by mixing *across* grades was intrinsic to the grading system itself. "Out of this right to mix," declared the *Tribune*, "grows the whole possibility of fraud."¹⁵⁵ The incentive to mix across grades, like the ability to run a corner, flowed directly from the partitioning of Chicago's grain market. The Board's grading system relied on the conventional fiction that grain was uniform within grades, but physical grain remained as variable as ever. Even the Board admitted that grading could not do "*even and exact justice . . . to every car load of grain,*" for "that would require that there should be no variation whatever in different lots of grain graded into the same class." In fact, there *had* to be such variation, for the whole point of the grading system was to simplify the minute differences among real grain shipments so that they could be more easily combined and traded. "Between a very good car of, say No. 1 or No. 2 spring wheat, and a very poor car of the same grade," observed the Board, "there may be several cents difference of actual value. . . ."¹⁵⁶

Those who combined grades used the Board's necessary fiction of within-grade homogeneity to profit from the very real heterogeneity of physical grain: mixing happened on the boundary between first and second nature, and was possibly only because of the tension between them.

Whatever the logic behind it, mixing disturbed farmers and Board members alike, for it seemed to call into question the honesty and integrity of the whole grading system. What made mixing particularly objectionable was the uniquely powerful position of elevator operators, who could earn large sums of money by manipulating the physical partitions between grain bins so as to profit from the conceptual partitions between grain grades. By mixing grain to bring it as close as possible to the lower boundary of a grade, elevators could capture the hidden value of intra-grade variation for themselves, an act that seemed both dishonest and unfair.¹⁵⁷

But this was by no means the only complaint that farmers and Board members had against the elevators. Equally objectionable were the legal agreements elevator operators made with the railroads to segment Chicago's grain-handling market geographically. By 1870, Chicago had seventeen elevators with a total capacity of 11.6 million bushels of grain. Each received grain from only a single railroad, and each had a contract which gave it exclusive rights to the grain delivered by that road.¹⁵⁸ The railroads rarely operated elevators themselves, but received a percentage of the elevators' profits as part of the agreement between them. Five private partnerships managed all the large elevators in the city. Moreover, the ten to fifteen individuals who made up these partnerships were financially so closely linked to each other, and had so successfully restricted the possibilities of competition among themselves, that they effectively acted as a single bloc. When farmers and traders complained about an "elevator monopoly" in Chicago, they knew what they were talking about.¹⁵⁹

Farmers and shippers sending grain to Chicago had virtually no choice about which elevator their grain entered; this enabled elevators to set uniform rates without fear of losing business. A typical elevator charge in the 1860s was two cents per bushel, which included receiving, twenty days storage, and shipping; this amounted to about 5 percent of the total transport cost of moving grain from its point of origin to New York.¹⁶⁰ On that basis, the *Prairie Farmer* in 1864 calculated Chicago's total elevator income to be roughly \$1 million, with about \$80,000 going to an average elevator and more than double that to a large one.¹⁶¹ The lack of cost data makes it difficult to estimate profit rates from these figures, but elevator operators did declare personal incomes ranging from \$30,000 to \$100,000 per year during the 1860s.¹⁶²

People debated among themselves whether such incomes were legiti-

mate. The *Prairie Farmer*, speaking to a rural audience, concluded that "no business men in Chicago are more rapidly becoming independently rich than the warehousemen. Their fortunes are being made entirely from off the farmers of the country."¹⁶³ Probably because Board members understood better than farmers the practical necessity of grain elevators in the Chicago market—some undoubtedly remembered the much higher handling costs of water-based transport before elevators existed—they were prepared to be more generous in the face of such charges. While concluding at the end of an official investigation in 1866 that the rates for storage of grain in Chicago were "quite high enough," a Board committee noted that they were no higher than rates charged by elevators in Buffalo, at the other end of the Great Lakes transportation corridor.¹⁶⁴ Elevators performed an important service in moving grain to market, said the Board, and those who benefited from that market—farmers and traders both—should expect to pay a reasonable charge for the service.

Board members had different fears about the elevators which farmers were less likely to share, for grain traders worried about the elevators' power to threaten the integrity of the Board's own market.¹⁶⁵ Whether the price of grain rose or fell on the floor of 'Change depended, at least from the supply side, on how much grain the bulls and bears thought the city's elevators contained. The elevator operators, unlike everyone else, actually *knew* such numbers to the nearest bushel, and so had an enormous advantage when speculating—usually secretly—in the market.¹⁶⁶ "The warehousemen," one observer reported, "had the inside track, because they knew exactly the amount of grain on hand."¹⁶⁷ Elevator operators could predict ordinary price movements better than most traders. They knew when a grain could probably be cornered, and when a corner could probably be broken. As one Cook County politician remarked, the elevators were not only "the largest gamblers in grain in Chicago . . . , but gamblers who play with marked cards"¹⁶⁸

Gambling with marked cards involved more than just knowing how much grain Chicago's elevators contained. Both the grading system and the futures market depended on elevator receipts for their very existence, and the elevator operators controlled those receipts in a way no one else could. By issuing receipts, the elevator operators effectively printed money. The money was good as long as there was grain corresponding to each receipt. But if elevator operators illegally issued counterfeit receipts for grain that did not exist, they could mint themselves a fortune without anyone's ever knowing. Corners presented special opportunities in this respect. At the height of a corner, an elevator operator might gradually sell 10,000 bushels worth of counterfeit receipts to speculators who were desperately trying to meet the obligations of their futures contracts.

Later, after the corner was over and the price of grain had fallen, say, forty cents, the operator could buy back those 10,000 receipts and pocket \$4,000 from the transaction, with no one the wiser. Elevator operators could also collude with speculators who were running a corner by refusing to admit how much grain they had in store, or by falsely declaring that the grain they did have was "heating"—spoilage—and could no longer be traded. All of these maneuvers were illegal, but they appear to have occurred with some frequency during the late 1860s. In the absence of effective means for regulating and policing the elevators, little could be done to prevent such abuses.¹⁶⁹

In the years following the Civil War, then, critics of Chicago's grain market had a long list of indictments against the city's elevators: fraudulent grading, dishonest weighing, mixing grades, restricting competition, hiding storage information, and issuing false receipts.¹⁷⁰ Each charge began with a question about appropriate market boundaries—between one grade and another, between public and private information, between legitimate and illegitimate business practices—and ended with a question about who should have the power to set those boundaries. If people were to trade grain not as a physical good but as a categorical abstraction, then sellers and buyers were bound to fight about how to categorize it. Once grain grades existed, *someone* would benefit from intra-grade variations in real value. Farmers, elevator operators, grain traders, and millers could hardly avoid having different views about who that beneficiary should be.

Other boundaries were equally in dispute. Some believed that elevator charges were too high, and would come down only if railroads and elevators were forced to abandon their monopolies of the city's transportation markets: shippers should be able to send grain to any elevator they chose, not just the one associated with a particular railroad. Grain traders required accurate knowledge of the grain supply to set prices, and so Board members and elevator operators fought with each other over the boundaries between public and private information: elevators, critics said, should be forced to release accurate statistics about the grain they held in store. And although no one actually defended counterfeit receipts, they too marked a contested boundary, for if corrupt elevator operators insisted on issuing them, all elevator receipts—and with them the grain market as a whole—would be cast in doubt. Each of these conflicts raised serious questions about how to maintain the necessary boundaries of a partitioned market and still protect that market's integrity as perceived by all who participated in it. For just this reason, the Chicago Board of Trade and several of the city's leading newspapers—not the farmers—actually led the attack against the elevators.¹⁷¹

Efforts to reform Chicago's grain-trading institutions—to legally de-

fine their boundaries and make them more answerable to the public—came to a head in the decade following 1865 as part of a much broader agrarian movement, identified with the Grange, whose main targets were the railroads.¹⁷² In 1866, the Illinois legislature considered a bill, sponsored by Senator F. A. Eastman of Chicago's Cook County, to regulate warehouses. The bill called for public elevator inspection, limits on mixing, mandatory publication of warehouse statistics, and open competition among elevators. These were all reforms that individual members of the Board of Trade had been proposing as ways to limit elevator abuses, although the Board itself had not yet taken a stand in their support. When members learned that the Board's directors favored a watered-down version of Eastman's bill, they called a mass meeting to repudiate the directors' action. At the meeting, members passed a resolution declaring that they believed "that there are serious abuses exerting a very depressing influence upon the grain trade" and therefore "that any action which may be taken by the State Legislature towards placing the grain warehouses of this city under wholesome legal restrictions will meet with the unqualified approbation and cordial sympathy and support of the Board."¹⁷³ Board members promptly raised funds to send a committee of one hundred to Springfield to lobby in support of the Eastman bill. In the meantime, newspapers like the *Tribune* published exposés that heightened agrarian anger about corrupt elevator practices.

To defend themselves, elevator operators apparently bribed members of the legislature to eliminate the most threatening provisions of the bill and to limit its enforcement mechanisms. They also tried to get back at the Board by having a friendly legislator add an amendment outlawing futures as "void and gambling contracts," thereby making much of the Board's market illegal. Irritating as this may have been to members of the Board, no one ever seriously tried to enforce the clause, and the legislature repealed it in 1869. To the disappointment of farmers and Board members alike, the same thing happened to the elevator regulations: because their enforcement depended on someone's bringing civil suit, and because no one in the grain business was willing to take that risk against such formidable adversaries, the Warehouse Act of 1867 proved ineffective from the beginning.¹⁷⁴

Political agitation against both railroads and elevators continued to grow, culminating as far as the Chicago elevators were concerned in the Illinois constitution of 1870 and the Warehouse Act of 1871. Arguing that the new constitution should empower the state to regulate transportation and trade within its boundaries, agrarian protesters gathered in April 1870 in Bloomington. They were greeted upon their arrival by a letter from Governor John Palmer promising that "freights and all that

relates to the transportation, storage, and sale of the products . . . of the country shall be relieved from the arbitrary rule of monopolies, and subjected to such regulations as may harmonize with reason and justice." There was also a letter from the president of the Chicago Board of Trade. The Board's members, he said, "feel the deepest interest in the deliberations of your body, and trust they may result in substantial good to the producing interests of the Northwest." Those in attendance "heartily applauded" both letters, pleased that such powerful allies had decided to join them: Illinois farmers and Chicago grain traders would make common cause.

The farmers' meeting at Bloomington proceeded to pass a series of resolutions urging the constitutional convention to reduce "unreasonable and oppressive" rates and to define unambiguously their "legal rights to transportation and market."¹⁷⁵ But they did not try to define those "legal rights" themselves. Indeed, they seemed to have a curiously abstract sense of the system that moved and marketed their crops, no doubt because the institutions of that system were so remote, impersonal, and hidden from public view. Although the farmers sought the forward-looking goal of having the government regulate railroad rates and elevator charges, several of their suggestions looked backward to older technologies and economic practices. To solve the problem of railroad "monopoly," they proposed developing new canals that might provide alternative competitive routes, not fully understanding either the fixed-cost problems of railroads or the difficulty that many waterways would soon have holding their own competitively. They and the governor speculated about making the railroads true "common carriers" like highways and canals, allowing anyone to run trains over a given set of tracks, not understanding why this made less sense for railroads than for most other forms of transportation. And they objected to "the practice of the railway companies of delivering grain to warehouses . . . without the consent and against the protest of the grain owners and shippers," apparently not fully grasping how essential elevators and their common bins had become to moving grain by rail.¹⁷⁶ The farmers did not address the subtleties of grading, elevator storage, or grain trading, preferring to express a generalized hostility toward the oppressive power of "monopolies." That the problems of grain marketing might be more structural, built into the very system that enabled farmers to sell their crops in the first place, does not seem to have occurred to them.

At the Illinois Constitutional Convention itself, much of the leadership that proposed concrete solutions to the elevator problem came not from hinterland farmers like those who met at Bloomington but from people in Chicago who knew the city's grain trade at first hand. Chicago-

based publications such as the *Prairie Farmer*, the *Western Rural*, and especially the *Chicago Tribune* led the way in arguing for government intervention against corrupt elevator practices. The *Tribune*, for instance, reported that among farmers in the city's hinterland, "the name of a Chicago warehouseman has become a synonym with that of a pirate. . . . It may be safely affirmed that no man voluntarily sends his grain to Chicago who can send it elsewhere."¹⁷⁷ Negative perceptions of this sort could only hurt the city in general, so booster editors who wished to protect Chicago took it upon themselves to ferret out corruption and hold it up for public condemnation. Because such newspapers were widely read throughout the state, they helped shape public thinking about the issue. Much of the most damaging information that farmers knew about Chicago's markets came to them via the Chicago newspapers, which had in turn learned insider stories from grain traders at the Chicago Board of Trade. If, as many farmers believed, Chicago was the font of corruption in the grain trade, the city also pointed the way to its own redemption.

The constitution's proposed article for regulating grain warehouses had in fact been drafted by none other than a committee of the Board of Trade. This led at least one rural delegate to oppose elevator regulation as "a grain gamblers' article, and not a farmers' article."¹⁷⁸ Another rural delegate thereupon leapt to the measure's defense by declaring that although "this report came from the city of Chicago" and "had its manliness and all its garments laid on there," he was still "willing to receive anything good, that may come out of evil."¹⁷⁹ The *Tribune's* reform editor, Joseph Medill, was himself a delegate and delivered what was probably the convention's most grandiloquent indictment of the elevators:

The fifty million bushels of grain that pass into and out of the city of Chicago per annum, are controlled absolutely by a few warehouse men and the officers of railways. They form the grand ring, that wrings the sweat and blood out of the producers of Illinois. There is no provision in the fundamental law standing between the unrestricted avarice of monopoly and the common rights of the people; but the great, laborious, patient ox, the farmer, is bitten and bled, harassed and tortured, by these rapacious, blood sucking insects.¹⁸⁰

With the republican body politic so infested with vermin, Medill argued, only the law could "step between these voracious monopolies and the producers." The new constitution should attack the elevator plague, save the farmer, and redeem Chicago at the same time.

Article 13 as it finally appeared in the 1870 constitution remained largely as Board members had written it. It designated all warehouses in Illinois to be "public," thereby asserting the state's power to regulate

their activities and confirming a grain owner's right to inspect the goods stored in such places.¹⁸¹ Despite the statewide definition of public warehouses, convention delegates understood their real target and did not wish to subject rural warehouse owners to needless costs and regulations. The most important requirements of the article therefore applied only to elevators in cities with over 100,000 inhabitants—and there was only one such city in Illinois. Elevators in Chicago were to post weekly notices of how much grain of each grade they had in store. To prevent them from issuing fraudulent receipts, they were to keep a public registry of all outstanding receipts they had issued. And they were forbidden to mix different grades without permission. Furthermore, all railroads in the state were required to deliver grain to any elevator a shipper desired—and, if necessary, permit new track construction to accomplish this.¹⁸²

The Illinois legislature supplemented Article 13 in 1871 with a series of laws assigning the task of grain inspection to a new Railroad and Warehouse Commission that would henceforth regulate all grain movement and storage in the state. Much to the chagrin of Board of Trade members, the Warehouse Act of 1871 separated the grading system from the organization that had invented it.¹⁸³ But the Board itself had abandoned internal inspection of elevators in April 1870 after a dispute with elevator operators that may also have been an effort to lobby the constitutional convention for greater inspection powers. If it was a lobbying effort, the action backfired when the Board's inspectors fell under a cloud that confirmed public perceptions that they might be nearly as corrupt as the elevators themselves. In January 1871, the Board suddenly suspended its chief grain inspector, R. McChesney, after learning that he had graded as no. 2 oats a shipment of no. 3 oats mixed with Rejected barley, apparently at the behest of one of the Board's own directors.

The *Tribune* used the occasion to attack the integrity of the entire inspection system, fanning political hostility toward the Board just as the legislature was considering the new warehouse law. As a result, the Illinois government took over all grain inspection in the state. But the Board's original system otherwise changed little. The new state control of grain inspection undoubtedly helped diminish public suspicions about Chicago grading in general. By 1874, faith in Chicago inspection had been so restored that the city's grades were accepted without dispute in New York, Philadelphia, Baltimore, Boston, Montreal, and other eastern ports. Disputes about the grading of individual shipments continued, but farmers too appear to have become more content once the state took over grain inspections.¹⁸⁴

In short, Article 13 and the 1871 Warehouse Act addressed each of the boundary problems that had so concerned farmers, grain traders, and

other elevator critics during the 1860s: grading, inspection, mixing, counterfeit receipts, public grain supply statistics, and the monopoly linkage between railroads and elevators. Although complaints about grain elevators persisted long into the future, the new legislation laid the essential legal foundation for regulating any abuses that might occur.¹⁸⁵ Elevator operators initially contested the legality of the new laws by refusing to take out licenses for themselves, thereby denying that Illinois had a right to regulate their activities. When the state prosecuted them, public outcry about the case was so strong that voters changed the composition of the Illinois supreme court to make sure that the Warehouse Act and other new "Granger laws" would be declared constitutional.

Finally, in 1877, the U.S. Supreme Court issued its famous ruling in *Munn v. Illinois*, establishing forever the principle that grain elevators and other such facilities were "clothed with a public interest" and could not escape state regulation.¹⁸⁶ The name of Ira Munn, Chicago's leading elevator operator, would henceforth be associated with the legal ruling which enabled state governments to regulate the boundary between private interest and public good in economic matters. In making their decision, the justices were clearly impressed by what they saw as the harmful public consequences of monopoly power at Chicago's grain elevators, but the case had much wider ramifications. As one early student of the subject remarked in 1928, *Munn v. Illinois* "was epoch making in its consequences," and "through it the Granger Movement has remained an active force in American history to the present day."¹⁸⁷

Necessary Fictions

Chicago's relationship to the new "public interest" as articulated in *Munn* can only be called ambivalent. On the one hand, the city's grain elevators had significantly benefited "the public" by joining with the railroads to liberate western farmers from the constraints of water and winter, vastly increasing the amount of grain that could move to market. That farmers and merchants no longer needed to float rafts down prairie streams or haul wagons over muddy roads to sell their grain was due to the very railroads and elevators which now linked them so powerfully and troublingly to Chicago's marketplace. The *Prairie Farmer* explained, "In connection with our immense grain warehouses, but little cessation of the grain trade occurs during the close of navigation, and a market is afforded the farmer at all times."¹⁸⁸

On the other hand, elevator operators had also taken advantage of "the public" by seeking to profit from virtually every ambiguous bound-

ary in the city's partitioned markets. One delegate to the constitutional convention remarked, "I am satisfied that there is no institution in the State of Illinois that can pile up money like the elevators in Chicago."¹⁸⁹ The critics probably went too far in claiming that the elevators had systematically "stolen" vast sums of money from the public, but the case against them was easy enough to make. Many of Chicago's leading citizens and institutions—newspapers, politicians, grain traders, the Board of Trade itself—had made just that case, organizing downstate efforts to regulate elevator power. The willingness of these Chicagoans to criticize their own city suggests their genuine ambivalence about its markets. They attacked abuses in the interests of reform, but also to defend their own self-interest and to maintain the city's dominance. In the process, they often found themselves tarred with the same anti-Chicago brush as the elevators they attacked.

No institution reflected this ambivalence more than the Board of Trade, which led the campaign against the elevators even as it became the object of similar campaigns itself. One rural delegate used almost the same metaphors to attack the Board and its "grain gamblers" as Joseph Medill had used against the elevators: "They are leeches upon commerce and the community, that suck the life blood out of the farmers and dealers in grain, without contributing anything towards the general wealth or productions of the country. They swarm like lice upon the body politic and feed and fatten upon its substance."¹⁹⁰ From this perspective, those who stalked the floor of 'Change to amass fortunes by buying and selling futures, cornering markets, and trading grain without adding any value to it shared the corruption of the elevator operators. They too stole rather than earned their livelihoods. They too were parasites on the honest labor of farmers. One rural orator declared in 1866, "The Board of Trade of Chicago is one of the considerable obstructions that stand between the farmer and the ultimate market to which his grain must go. The different devices by which they shave him right and left, going through Chicago, is [*sic*] one of the greatest oppressions to which he must submit."¹⁹¹

And yet these same traders who speculated and gambled in the golden products of the fields were also the people farmers depended upon to buy and sell their crops. Despite all the cries of fraud, corruption, and monopoly directed against it, Chicago's immense grain market, with all of its speculative frenzy, served as a clearinghouse for the capital and credit that moved western crops to their final customers. It had improved the efficiency of trade and transport alike, so that many more farmers were able to sell much larger quantities of grain than ever before. The Board's grading system had created an opportunity for elevators to skim off the profits hidden within individual grades, but it also created an economic

incentive for farmers to clean their grain and increase its value, while making possible the elevators' much reduced cost of grain handling generally. The daily trading on the floor of 'Change, combined with the constant supply of grain in the city's elevators, created a year-round market that had never before existed, so farmers could still sell grain in the dead of winter. Even futures trading offered real benefits by enabling buyers and sellers to contract in advance for grain deliveries, thereby shifting the risk of future price changes to speculators who were more willing or able to absorb that risk.¹⁹² Much more than the residents of Chicago's hinterland usually acknowledged, farmers depended on the Board of Trade for their very livelihoods. Far from standing as an "obstruction" between grain and its ultimate market, the floor of 'Change was where grain *found* its final markets. As another delegate to the constitutional convention argued, "If there is nobody at Chicago or other great markets to buy grain, then the farmer does not get a reward for his labor."¹⁹³

The ambivalence of the Board's position was structural. Although it controlled the circumstances of Chicago's trade, establishing the rules by which anyone—farmers, millers, speculators, corner runners—could buy and sell grain, it did not control the trade itself. It provided the stage on which other actors played. In serving as home to bulls and bears alike, it played host to as many losers as winners. Its members—who numbered well over twelve hundred by the 1870s—included many more small traders than elevator operators, railroad corporations, or large speculators.¹⁹⁴ Most members were committed to keeping their playing field level, resisting any presence that threatened either to become a monopoly or to subvert the contractual rules of the trading game. Their stance toward the grain trade was classically liberal: they defended an open market within the boundaries they had defined for that market, and did not make distinctions among those who stayed within the boundaries. Their liberal stance led them to fight elevator fraud, but also to accept corners and other peculiarities of the futures trade. This very neutrality was part of what made the Board suspect in the eyes of its critics. The Board could go so far as to write the article of the Illinois' constitution governing warehouse regulation—and yet still seem a villain to delegates who, even as they voted for that article, declared their wish to "have nothing to do with the board of trade," that "monstrosity in the commercial world."¹⁹⁵

Hostility toward the Board, and toward Chicago's grain trade in general, flowed from rural suspicions that there was something not quite real—something false, something dishonest—about its markets. The city was remarkable in handling the floodtide of grain that moved through its railroads, elevators, and ships, all of which seemed real enough. But it

was equally remarkable for having redefined the *meaning* of grain within an intricate web of market fictions, abstracting and simplifying it to facilitate its movement not as a physical object but as a commodity. The trading of grain as a commodity was what made Chicago's market seem unreal to those who stood outside it.

Wheat and corn came to Chicago from farms that were themselves radical simplifications of the grassland ecosystem. Farm families had destroyed the habitats of dozens of native species to make room for the much smaller bundle of plants that filled the Euroamerican breadbasket. As a result, the vast productive powers of the prairie soil came to concentrate upon a handful of exotic grasses, and the resulting deluge of wheat, corn, and other grains flowed via the railroads into Chicago. And there another simplification occurred. In their raw physical forms, wheat and corn were difficult substances: bulky to store, hard to handle, difficult to value properly. Their minute and endless diversity embodied the equal diversity of the prairie landscape and of the families who toiled to turn that landscape into farms. An older grain-marketing system had preserved the fine distinctions among these natural and human diversities by maintaining the legal connection between physical grain and its owner. But as the production of western grain exploded, and as the ability to move it came to depend on capital investments in railroads and elevators, the linkage between a farm's products and its property rights came to seem worse than useless to the grain traders of Chicago. Moving and trading grain in individual lots was slow, labor-intensive, and costly. By severing physical grain from its ownership rights, one could make it abstract, homogeneous, *liquid*. If the chief symbol of the earlier marketing system was the sack whose enclosure drew boundaries around crop and property alike, then the symbol of Chicago's abandonment of those boundaries was the golden torrent of the elevator chute.

The original decision to remove grain from its sacks was undoubtedly a pragmatic one, driven by the technological possibilities of the grain elevator. Probably no one foresaw that so simple an act would have such complex consequences, imposing a new symbolic order on Chicago's marketplace and distancing it from the physical universe of fields and crops and rural nature. The shift from sack to elevator enabled grain traders to come indoors, to a market called 'Change where sheets of paper would stand as surrogates for grain bought and sold in millions upon millions of invisible bushels. The shift to standard grades meant that those sheets of paper represented not real physical grain but abstract conventions whose homogeneity was the condition that made them interchangeable. Interchangeability in turn made it possible to sell grain not only over great distances of space but over extended periods of time as

well, for the futures market depended for its existence on the standardized fictions that enabled traders to buy and sell grain they had never seen, because it did not yet exist.¹⁹⁶ Those who dealt in futures extended the abstraction of Chicago's market by dealing not in grain, not even in elevator receipts, but in the prices that *future* elevator receipts would bring when they finally came into being several weeks or months later.

Chicago grain traders dealt in the physical products of an agricultural landscape by transforming them into commodities defined by the market itself. Insofar as farmers were already raising corn and wheat with the intention of selling them, these grains had been commodities long before the founding of the Chicago Board of Trade. But 'Change altered their meaning, distancing them from the rural farm and tying them ever more closely to the urban market in which they were exchanged. The very language of the market reshaped the objects traded within it. To understand wheat or corn in the vocabulary of bulls, bears, corners, grades, and futures meant seeing grain as a commodity, not as a living organism planted and harvested by farmers as a crop for people to mill into flour, bake into bread, and eat. As one bewildered delegate to the Illinois Constitutional Convention remarked after trying to read a Chicago market report, "this 'buying short' and 'buying long' and the 'last bulge' is perfect Greek to the grain producer of the State."¹⁹⁷

By imposing their own order and vocabulary on the world of first nature, the city's traders invented a world of second nature in which they could buy and sell grain as commodity almost independently from grain as crop. "In the business centre of Chicago," wrote a bemused visitor in 1880, "you see not even one 'original package' of the great cereals."¹⁹⁸ In Chicago, the market turned inward upon itself to trade within its own categories and boundaries. Although the futures market marked the most significant step in this direction, an equally symbolic change occurred in 1875. In that year, the Board of Trade decided that its own memberships—roughly two thousand in number—should be offered for sale in the open market, to be bought and sold as commodities in their own right. This "policy of making these memberships merchandise" would henceforth be the way people acquired the right to trade on the floor of 'Change, offering their services to anyone on the outside who wished to buy or sell grain there.¹⁹⁹ By this decision, the Board began to conduct a market in the market itself: boxes within boxes within boxes, all mediating between the commodified world inside and the physical world outside.

Physical grain did not, of course, disappear from the Chicago market, obscured though it might be behind the various fictions of grain as commodity. The success or failure of crops and the dietary needs of people

around the world—however abstract these might have seemed from the floor of 'Change—remained the ultimate conditions of supply and demand underlying even the most commodified of grain markets.²⁰⁰ The Board of Trade's greatest problems always occurred on the boundaries where its market fictions intersected with the real world. When speculators cornered the futures market, they succeeded because trapped traders really did have to meet expiring contracts with physical grain. Farmers believed Chicago was robbing them because standard grades really did obscure legitimate differences in the value of grain shipments, thereby creating innovative opportunities for "theft." People struggled about grading, mixing, and trading grain because Chicago's market abstractions did finally connect with the real world. Grain as crop and grain as commodity maintained an uneasy truce on the floor of 'Change, a truce that remade the agricultural landscape of the Great West.

- briel Kolko, *Railroads and Regulation, 1877-1916* (1965); and Albrow Martin, *Enterprise Denied: Origins of the Decline of American Railroads, 1897-1917* (1971). On the early political controversies surrounding railroad regulation in the East, see Lee Benson, *Merchants, Farmers, & Railroads: Railroad Regulation and New York Politics, 1850-1887* (1955). For a good example of the Populist attack on railroads, see William Larrabee, *The Railroad Question: A Historical and Practical Treatise on Railroads, and Remedies for Their Abuses* (1893). For a lucid early presentation of the reasons why railroad managers almost inevitably had to resort to some sort of price-fixing mechanism, given their problems with capital costs and competition, see Baker, *Monopolies and the People*, 42-58, which is well summarized in his conclusion: "The railway is essentially a monopoly, not, be it noted, because of any especial wickedness of its managers or owners, but because competition is impossible as regards the greater part of its business, and because wherever competition is possible, its effect, as the managers well know, would be to annihilate all profits from the operation of the road" (p. 52).
128. Nimmo, *Rept. Int. Commerce*, (1877), 24.
 129. Brooks, "Chicago and Its Railways," 269.
 130. Nimmo, *Rept. Int. Commerce* (1881), 106.
 131. Robert Harris to C. E. Perkins, Oct. 30, 1867, CB&Q Archives.
 132. Robert Harris to A. J. [?] Bell, April 16, 1868, CB&Q Archives.
 133. Robert Harris to H. F. Clark, Dec. 26, 1867, CB&Q Archives.
 134. Handwritten notes on letter from A. R. Anderson of the Iowa Railroad Commissioners Office to T. J. Potter, General Manager of the CB&Q at Chicago, Aug. 3, 1881, CB&Q Archives, box 33 1880 4.6.
 135. Robert Harris to H. H. Porter, March 18, 1869, CB&Q Archives, H 4.1.
 136. Julian Ralph, *Our Great West: A Study of the Present Conditions and Future Possibilities of the New Commonwealths and Capitals of the United States* (1893), 12.
 137. Karl Marx, *Grundrisse: Foundations of the Critique of Political Economy (Rough Draft)*, trans. Martin Nicolaus (1973), 524.
 138. Bross, *Chicago and Her Growth*, 14.

3: PRICING THE FUTURE: GRAIN

1. Caton, "Sixty Years," 590. Cf. Caton, "Address Delivered to the Settlers," 165.
2. On the origins of domesticated plants and animals, see Carl O. Sauer, *Agricultural Origins and Dispersals* (1952; reprint, 1969); Peter J. Ucko and G. W. Dimbleby, *The Domestication and Exploitation of Plants and Animals* (1969); John R. Campbell and John F. Lasley, *The Science of Animals That Serve Humanity*, 3d ed. (1985); Robert W. Schery, *Plants for Man*, 2d ed. (1972); Juliet Clutton-Brock, *A Natural History of Domesticated Animals* (1987); Jack R. Kloppenburg, Jr., *First the Seed: The Political Economy of Plant Biotechnology, 1492-2000* (1988); see also the general historical works cited in the next footnote.
3. Allan G. Bogue, *From Prairie to Cornbelt: Farming on the Illinois and Iowa Prairies in the Nineteenth Century* (1963), remains the classic work on this subject. It contains material relevant to much of the discussion in this chapter, as do Fred A. Shannon, *The Farmer's Last Frontier: Agriculture, 1860-1897*, vol. 5 of *The Economic History of the United States* (1945); Paul W. Gates, *The Farmer's Age: Agriculture, 1815-1860*, vol. 3 of *The Economic History of the United States* (1960). For a summary of trends in the Chicago area, see Robert H. Engle, "The Trends of Agriculture in the Chicago Region" (Ph.D. thesis, Univ. of Chicago, 1941); and for a general survey of agricultural history, John T. Schlebecker, *Whereby We Thrive: A History of American Farming, 1607-1972* (1975). The most sophisticated recent study is Jeremy Atack and Fred Bateman, *To Their Own Soil: Agriculture in the Antebellum North* (1987).
4. Bogue, *Prairie to Cornbelt*, 1-7; John Madson, *Where the Sky Began: Land of the Tallgrass Prairie* (1982), 38-40, 116-17. For a useful anthology of contemporary descriptions of the prairie, see Dorothy Anne Dondore, *The Prairie and the Making of Middle America: Four Centuries of Description* (1926); Thomas H. Macbride, "Landscapes of Early Iowa" (1895), reprinted in *Palimpsest* 7 (1926): 283-93; and Charles Aldrich, "The Old Prairie Slough," *Annals of Iowa*, 3d ser., 5 (1901): 27-32. On vegetation, see Edgar Nelson Transeau, "The Prairie Peninsula," *Ecology* 16 (1935): 423-37; Paul D. Kilburn, "The Forest-Prairie Ecotone in Northeastern Illinois," *American Midland Naturalist* 62

- (1959): 206-17; Cassandra S. Rodgers and Roger C. Anderson, "Presettlement Vegetation of Two Prairie Peninsula Counties," *Botanical Gazette* 140 (1979): 232-40.
5. Madson, *Where the Sky Began*, 38.
6. Leo Rogin, *The Introduction of Farm Machinery in Its Relation to the Productivity of Labor in the Agriculture of the United States during the Nineteenth Century* (1931), 32-35; Wayne G. Broehl, Jr., *John Deere's Company: A History of Deere & Company and Its Times* (1984).
7. Bogue, *Prairie to Cornbelt*, 67-85.
8. On the spread of tame hay, see Thomas A. Williams, "Timothy in the Prairie Region," in USDA, *Yearbook of the United States Department of Agriculture, 1896* (1897), 147-54; and Jonathan Periam, *The Home and Farm Manual* (1884; reprint, 1984), 132-66; and Gates, *Farmer's Age*.
9. On the importance of fences as a symbol of environmental "improvement," see William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (1983).
10. *Illinois in 1837 & 8*, 14. Cf. John Plumbe, Jr., *Sketches of Iowa and Wisconsin, Taken during a Residence of Three Years in Those Territories* (1839), 9.
11. The literature on the ecological consequences of prairie fires is enormous. For useful introductions, see Stephen J. Pyne, *Fire in America: A Cultural History of Wildland and Rural Fire* (1982); and Curtis, *Vegetation of Wisconsin*. For shorter and more monographic treatments, see Richard T. Ward, "Vegetational Change in a Southern Wisconsin Township," *Proceedings of the Iowa Academy of Science* 63 (1956): 321-26; R. Daubenmire, "Ecology of Fire in Grassland," *Advances in Ecological Research* 5 (1968): 209-66; Richard J. Vogl, "Effects of Fires on Grasslands," in T. T. Kozlowski and C. E. Ahlgren, eds., *Fire and Ecosystems* (1974), 139-94; and Virginia M. Kline and Grant Cottam, "Vegetation Response to Climate and Fire in the Driftless Area of Wisconsin," *Ecology* 60 (1979): 861-68. On the threat of prairie fires, see Bessie L. Lyon, "The Menace of the Blue-stem," *Palimpsest* 21 (1940): 247-58.
12. The classic work on the public lands is Gates, *Public Land Law Development*; see also Malcolm J. Rohrbough, *The Land Office Business: The Settlement and Administration of American Public Lands, 1789-1837* (1968).
13. Hildegard Binder Johnson, *Order upon the Land: The U.S. Rectangular Land Survey and the Upper Mississippi Country* (1976); Norman J. Thrower, *Original Survey and Land Subdivision: A Comparative Study of the Form and Effect of Contrasting Cadastral Surveys* (1966). Johnson rightly points out that the grid pattern is not so exact as the word "checkerboard" suggests, but it certainly biased landowners toward rectilinear property boundaries.
14. J. M. Peck, *A Guide for Emigrants, Containing Sketches of Illinois, Missouri, and the Adjacent Parts* (1831), 106.
15. Henry Rowe Schoolcraft, "A Journey up the Illinois River in 1821," from *Travels in the Central Portion of the Mississippi Valley*, reprinted in Milo Milton Quaife, ed., *Pictures of Illinois One Hundred Years Ago* (1918), 96.
16. John G. Clark, *The Grain Trade in the Old Northwest* (1966), 41-42.
17. Harry N. Scheiber, "The Ohio-Mississippi Flatboat Trade: Some Reconsiderations," in David M. Ellis, ed., *The Frontier in American Development: Essays in Honor of Paul Wallace Gates* (1969), 278-79; Erik F. Haites, James Mak, and Gary M. Walton, *Western River Transportation: The Era of Early Internal Development, 1810-1860* (1975), 166.
18. Bogue, *Prairie to Cornbelt*, 8-13; see also the very sophisticated analyses of settlement dynamics in Michael J. O'Brien, ed., *Grassland, Forest, and Historical Settlement: An Analysis of Dynamics in Northeast Missouri* (1984). For contemporary descriptions, see the examples in Quaife, ed., *Pictures of Illinois*; Daniel Harmon Brush, *Growing Up with Southern Illinois, 1820 to 1861*, ed. Milo Milton Quaife (1944).
19. U.S. Censuses, 1830, 1850; Paullin, *Atlas of the Historical Geography*, plates 76-77.
20. The best general survey of early immigration to the upper Mississippi Valley is Mark Wyman, *Immigrants in the Valley: Irish, Germans, and Americans in the Upper Mississippi Country, 1830-1860* (1984); for a case study of German ethnicity in an urban setting, see Kathleen Neils Conzen, *Immigrant Milwaukee, 1836-1860: Accommodation and Community in a Frontier City* (1976).
21. U.S. Census, 1850.
22. Rebecca and Edward Burlend, *A True Picture of Emigration*, ed. Milo Milton Quaife (1848; reprint, 1968), 67.
23. The best study of frontier merchandising activities continues to be Lewis Atherton,

- Frontier Merchant in Mid-America*, though a broader picture of the overall distribution network of nineteenth-century marketing can be obtained from Glenn Porter and Harold C. Livesay, *Merchants and Manufacturers: Studies in the Changing Structure of Nineteenth-Century Marketing* (1971).
24. Burlend, *True Picture of Emigration*, 67.
 25. J. M. D. Burrows, *Fifty Years in Iowa* (1888), in Milo Milton Quaife, ed., *The Early Day of Rock Island and Davenport: The Narratives of J. W. Spencer and J. M. D. Burrows* (1942), 162.
 26. *Ibid.*, 182-85.
 27. Burlend, *True Picture of Emigration*, 67-68.
 28. William Oliver, *Eight Months in Illinois; with Information to Emigrants* (1843; reprint, 1966), 88. On the importance of St. Louis as the chief entrepôt for upstream farming districts, see Plumbe, *Sketches of Iowa and Wisconsin*, 12.
 29. The best general survey of grain trading on the Great Lakes and Mississippi River is John G. Clark, *Grain Trade in the Old Northwest*; for later periods, I also benefited from Morton Rothstein's generosity in allowing me to read unpublished chapters of his work on the grain trade. There is a long-standing academic controversy about the aggregate importance of interregional trade in grain and other foodstuffs to the economic development of different parts of the United States. For important contributions to the debate, see Isaac Lippincott, "Internal Trade of the United States, 1700-1860," *Washington University Studies* 4 (1916): 63-150; Albert L. Kohlmeier, *The Old Northwest as the Keystone of the Arch of American Federal Union* (1938); Louis B. Schmidt, "Internal Commerce and the Development of National Economy before 1860," *J. Pol. Econ.* 47 (1939): 798-822; Douglass C. North, "Agriculture in Regional Economic Growth," *Journal of Farm Economics* 41 (1959): 943-51; Watkins, "A Staple Theory of Economic Growth," 141-58; Albert Fishlow, "Antebellum Interregional Trade Reconsidered," *American Economic Review (Supplement)* 54 (1964): 352-64; William K. Hutchinson and Samuel H. Williamson, "The Self-Sufficiency of the Antebellum South: Estimates of the Food Supply," *JEH* 31 (1971): 591-612; Sam B. Hilliard, *Hog Meat and Hoecake: Food Supply in the Old South, 1840-1860* (1972); Hilliard, "Antebellum Interregional Trade: The Mississippi River as an Example," in Ralph E. Ehrenberg, ed., *Pattern and Process: Research in Historical Geography* (1975), 202-14; Diane Lindstrom, *Economic Development in the Philadelphia Region, 1810-1850* (1978); Diane Lindstrom and John Sharpless, "Urban Growth and Economic Structure in Antebellum America," *Research in Economic History* 3 (1978): 161-216. My own view is that extraregional trade was critical at least on the margin to western farmers seeking cash income during early stages of frontier settlement, whatever its total contribution to southern plantation food supply (which has been one of the most contested topics of debate).
 30. J. W. Norris, *Norris' Business Directory and Statistics of the City of Chicago for 1846*, ed. Robert Fergus, *Fergus Historical Series*, no. 25 (1883), 36, 40.
 31. Moritz Busch, *Travels between the Hudson & the Mississippi, 1851-1852*, trans. and ed. Norman H. Binger (1971), 233.
 32. Oliver, *Eight Months in Illinois*, 89.
 33. *Carlinville (Ill.) Spectator*, as quoted in *Missouri Republic*, April 29, 1855, as quoted by Belcher, *Rivalry between St. Louis and Chicago*, 53.
 34. Anonymous, quoted by Taylor, ed., *Chicago Board of Trade*, 1:155.
 35. Percy Tracy Dondlinger, *The Book of Wheat: An Economic History and Practical Manual of the Wheat Industry* (1919): 221-22.
 36. *Norris' Business Directory for 1846*, 44-45; Alice E. Smith, *George Smith's Money: A Scottish Investor in America* (1966). George Smith's famous Chicago Marine and Fire Insurance Company was so successful that it supplied a sizable portion of Chicago's circulating currency during the 1840s and early 1850s, behaving as much like a bank as an insurance company. It was able to do this partly because the state legislature had imposed steep restrictions on the ability of Illinois banks to issue notes.
 37. Burrows, *Fifty Years in Iowa*, 183.
 38. ICPSR, "Historical Demographic, Economic and Social Data: The United States, 1790-1970" (machine-readable dataset of census statistics). Statistical work for this book is based on an eleven-state subset of the master series, containing economic and demographic statistics for Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, and South Dakota between 1840 and 1900. I shall refer to it hereafter as ICPSR Census Series. The argument here is based on a simple comparison of z-scores for decennial county growth rates between 1840 and

1860. For less geographically oriented versions of this same argument, see Douglass C. North, *The Economic Growth of the United States, 1790-1860* (1961; reprint, 1966), 146-53; and Fishlow, *American Railroads*, 207-15.
39. Gates, *Illinois Central Railroad*; Corliss, *Main Line of Mid-America*, 81-89.
 40. ICPSR Census Series; Fishlow, *American Railroads*, 211-12.
 41. Bureau of Statistics, Treasury Department, "The Grain Trade of the United States, and the World's Wheat Supply and Trade," in *Monthly Summary of Commerce and Finance of the United States* (January, 1900), 1958-60; CBT, *Annual Reports*.
 42. Haites, *Western River Transportation*, 8. The northern route had already surpassed New Orleans in shipments of flour at a much earlier date. See Thomas D. Odle, "The American Grain Trade of the Great Lakes, 1825-1873," *Inland Seas* 8 (1952): 103.
 43. Guy A. Lee, "History of the Chicago Grain Elevator Industry, 1840-1890" (Ph.D. thesis, Harvard Univ., 1938), 62. A railroad car was small compared with a canalboat or steamboat that might carry four to ten thousand bushels of grain. Chicago's problem was to combine many small loads into the much larger quantities that could be stored in a warehouse or transported on a ship.
 44. *Chicago Democratic Press*, Sept. 13, 1854, as quoted in Taylor, *Chicago Board of Trade*, 1:190-91.
 45. U.S. Treasury Department, "Grain Trade of U.S.," 1958.
 46. CBT, *Annual Reports*; Annual Review for 1854, *Chicago Daily Democratic Press*.
 47. The classic work on Chicago's grain elevators is Guy A. Lee's "History of the Chicago Grain Elevator Industry, 1840-1890," to which I am indebted for several of the central arguments of this chapter. Lee summarized his main points in "The Historical Significance of the Chicago Grain Elevator System," *Ag. Hist.* 11 (Jan. 1937): 16-32.
 48. Joseph Dart, "The Grain Elevators of Buffalo," *Publications of the Buffalo Historical Society* 1 (1879): 391-404. Thomas Odle traces the spread of grain elevators around the Great Lakes basin in his "American Grain Trade," 8 (1952): 189-92.
 49. Anthony Trollope, *North America* (1862), ed. Donald Smalley and Bradford Allen Booth (1951), 164. Trollope uses "corn" in the English sense, referring to wheat or to grain generally.
 50. Taylor, *Chicago Board of Trade*, 1:189. The shift from volume to weight was one step among many toward perceiving grain not as traditional human-scaled *units* but as interchangeable, abstract, and infinitely divisible *flows*.
 51. Although elevators grew enormously in size during the second half of the nineteenth century, their essential organization remained relatively unchanged. For illustrations and an excellent technical description of a Chicago grain elevator in the early 1890s, see *Scientific American* 65, no. 17 (Oct. 24, 1891): cover.
 52. *Chicago Weekly Democrat*, Sept. 19, 1848.
 53. Lee, "Chicago Grain Elevator Industry," 41.
 54. Annual Review for 1857, *Chicago Daily Press*, 7-8; U.S. Treasury Department, "Grain Trade of the U.S.," 1958. The comparison is unfair in the sense that Chicago's elevators would never have contained only wheat, but the point about relative grain-handling capacities nonetheless holds.
 55. Annual Review for 1857, *Chicago Daily Press*, 8.
 56. *Ibid.* "Two or three hundred" is undoubtedly an exaggeration, but the people involved in such a transfer surely numbered in the dozens.
 57. Scheiber, "Ohio-Mississippi Flatboat Trade," 297; Odle, "American Grain Trade," 8 (1952): 248-51.
 58. "The City of St. Louis," *Atlantic Monthly* 19 (June 1867): 656. The eventual solution to this problem, devised after the Civil War, was to build elevators with chutes that could be extended and retracted to accommodate any level of the river. See also John B. Appleton, "The Declining Significance of the Mississippi as a Commercial Highway in the Middle of the Nineteenth Century," *Bulletin of the Geographical Society of Philadelphia* 28 (1930): 274-75.
 59. Peyton, *Over the Alleghenies*, 325. Peyton visited Chicago in 1848.
 60. The Rock Island elevator described above cost \$150,000 to construct, on land valued at \$90,000, while the Illinois Central's two largest elevators had a combined value of \$650,000. Annual Review for 1857, *Chicago Daily Press*, 8.
 61. "The City of St. Louis," *Atlantic Monthly* 19 (June 1867): 656; Odle, "American Grain Trade," 8 (1952): 192.
 62. Annual Review for 1857, *Chicago Daily Press*, 8.

63. Ibid.; Odle, "American Grain Trade," 8 (1952): 190.
64. Annual Review for 1857, *Chicago Daily Press*, 7.
65. Trollope, *North America*, 164.
66. Annual Review for 1857, *Chicago Daily Press*, 7-8.
67. Colbert, *Chicago*, 48. Given the destruction of pre-1871 records in the fire, Taylor regards Colbert's brief account as one of the most reliable available for the Board's early history. Taylor, *Chicago Board of Trade*, 1:139-41.
68. On the origins of boards of trade in general, see Thomas Odle, "Entrepreneurial Cooperation on the Great Lakes: The Origin of the Methods of American Grain Marketing," *Bus. Hist. Rev.* 38 (1964): 439-55.
69. Colbert, *Chicago*, 50; Taylor, *Chicago Board of Trade*, 1:189-91. The Board urged merchants in Buffalo, Toledo, Milwaukee, and other cities to adopt similar standards for weight-based bushels—all soon did—and also suggested that they join in lobbying against New York's continued use of a half-bushel volume measure for grain transactions. Important as weight-based measures were becoming, New York ignored the appeal and did not use grain elevators until the 1870s. To anticipate my own argument, New York's intransigence about grain elevators resulted only in part from a conservatism encouraged by its preeminent position in the national economy. Because most of the city's grain arrived in the relatively large units represented by canalboats and oceangoing vessels, there was less need for the break-in-bulk capabilities offered by elevators. New Yorkers also faced the special problem of matching their own business practices with those of traders in the British Empire, who strongly favored sale by sample rather than by grade. New York's growing acceptance of the new elevator and grading technologies after 1870 corresponded with the increasing amount of grain entering the city in railroad cars.
70. Taylor, *Chicago Board of Trade*, 1:172-73, 189.
71. Colbert, *Chicago*, 49.
72. U.S. Bureau of the Census, *Historical Statistics*, ser. U279-80, 899, ser. E123-24, 209. The growth of Chicago's grain markets was strongly linked to international exports, about which there is a large literature. For important discussions, see R. F. Crawford, "An Inquiry into Wheat Prices and Wheat Supply," *Journal of the Royal Statistical Society* 58 (1895): 75-120; Egerton R. Williams, "Thirty Years in the Grain Trade," *No. Am. Rev.* 161 (1895): 25-33; William Trimble, "Historical Aspects of the Surplus Food Production of the United States, 1862-1902," *American Historical Association Annual Report for 1918* (1921), 223-39; Wilfred Malenbaum, *The World Wheat Economy, 1885-1839* (1953); Morton Rothstein, "America in the International Rivalry for the British Wheat Market, 1860-1914," *MHR* 47 (1960): 401-18; Rothstein, "The International Market for Agricultural Commodities, 1850-1873," in David T. Gilchrist and W. David Lewis, eds., *Economic Change in the Civil War Era* (1965), 62-82; Rothstein, "Antebellum Wheat and Cotton Exports: A Contrast in Marketing Organization and Economic Development," *Ag. Hist.* 40 (1966): 91-100; Harry Fornari, *Bread upon the Waters: A History of United States Grain Exports* (1973); C. Knick Harley, "Transportation, the World Wheat Trade, and the Kuznets Cycle, 1850-1913," *Explorations in Economic History* 17 (1980): 218-50; and Jeffrey G. Williamson, "Greasing the Wheels of Sputtering Export Engines: Midwestern Grains and American Growth," *ibid.*, 189-217.
73. CBT, *Annual Reports*. For the effect of the war on Chicago prices, see James E. Boyle, *Chicago Wheat Prices for Eighty-one Years* (1922), 14.
74. Colbert, *Chicago*, 50-51.
75. Ibid., 51; Taylor, *Chicago Board of Trade*, 1:220-21.
76. "The Metropolis of the Prairies," *Harper's New Monthly Magazine* 61 (1880): 726.
77. On grading systems generally, see Dondlinger, *Book of Wheat*, 221-26. So complete was this severing process by the 1860s that Chicago elevators began to issue general receipts for whole trainloads of grain, irrespective of who owned which particular lot; see Henry Crosby Emery, *Speculation on the Stock and Produce Exchanges of the United States* (1896), 38. For a discussion of grain grading in the modern world, see Lowell D. Hill, *Grain Grades and Standards: Historical Issues Shaping the Future* (1990).
78. *Chicago Daily Press and Tribune*, July 19, 1858.
79. Britannia, "Grain Marketing," *Prairie Farmer*, June 1852, 282.
80. Annual Review for 1857, *Chicago Daily Press*, 11.
81. CBT, *Annual Report for 1858*, 11.

82. For an example of this sort of report, see the *Chicago Daily Press and Tribune*, July 19, 1858. See also Taylor, *Chicago Board of Trade*, 1:242-43.
83. Taylor, *Chicago Board of Trade*, 1:227.
84. CBT, *Annual Report for 1858*, 11.
85. CBT, *Annual Report for 1860*, 13.
86. CBT, *Annual Report for 1858*, 10.
87. For the first several years, the chief inspector relied on assistants already employed as inspectors by the elevators to do the work of grading, but this created a clear conflict of interest and invited corruption. In 1860, therefore, the chief inspector began hiring his own team of inspectors, who could not be employees of the elevators and who earned their salaries by charging a fee for each inspection. See William G. Ferris, *The Grain Traders: The Story of the Chicago Board of Trade* (1988), 20-21.
88. "Grain and Flour Inspection," *Prairie Farmer*, July 18, 1861.
89. *Ibid.*
90. The 1859 charter is reprinted in an appendix to the Board's *Annual Report for 1877*, pp v-ix, and can also be found in Andreas, *History of Chicago*, 2:326.
91. The best modern history of the Board's regulatory apparatus is Jonathan Lurie, *The Chicago Board of Trade, 1859-1905: The Dynamics of Self Regulation* (1979). Lurie focuses on the legal history of the Board's regulatory apparatus in relation to state judicial oversight. More comprehensive but much less analytical histories include Taylor, *Chicago Board of Trade*; and Ferris, *Grain Traders*. For a brief popular survey, see Edward Jerome Dies, *The Wheat Pit* (1925); and James E. Boyle, *The Chicago Board of Trade: What It Is and What It Does* (1921).
92. Emery, *Speculation on Stock and Produce Exchanges*, 38. Emery's book remains a classic on the origins of futures markets in the United States, and his chief arguments about this subject appear in the work of most historians who have followed him.
93. F. H. West, a Milwaukee representative at the National Board of Trade meeting in Buffalo in 1870, addressed "the subject of issuing grain receipts by warehouses and elevators" as follows: "That is a new feature in the commerce of the West. . . . The managers of these elevators have adopted the practice of issuing receipts, and those receipts now enter largely into the commerce of our section of the country. They are in some respects analogous to bank-bills, and pass like bank-bills from hand to hand. In our Western States they are a favorite collateral security with banks; in fact they are nearly all the securities we have to offer for demand loans. . . ." *Proceedings of the Third Annual Meeting of the National Board of Trade, Held in Buffalo, December, 1870* (1871), 44. The commercial institution I describe in the text is more precisely known as a negotiable instrument, or a mercantile instrument of credit; for a survey of its history and development, see Joseph J. Klein, "The Development of Mercantile Instruments of Credit in the United States," *Journal of Accountancy* 12 (1911): 321-45, 422-49, 526-37, 594-607; 13 (1912): 44-50, 122-32, 207-17.
94. Taylor, *Chicago Board of Trade*, 1:135.
95. Richard B. DuBoff, "Business Demand and the Development of the Telegraph in the United States, 1844-1860," *Bus. Hist. Rev.* 54 (1980): 459-79; DuBoff, "The Telegraph and the Structure of Markets in the United States, 1845-1890," *Research in Economic History* 8 (1983): 256.
96. This effect had first been apparent at Buffalo, where the arrival of the telegraph in early 1847 reduced the traveling time of New York market reports from more than four days to just under one. See John Langdale, "The Impact of the Telegraph on the Buffalo Agricultural Commodity Market: 1846-1848," *Professional Geographer* 31 (1979): 165-69. On other effects of the telegraph, see DuBoff, "Telegraph and Structure of U.S. Markets," 253-77; and Allan Pred, *Urban Growth and City-Systems in the United States, 1840-1860* (1980), 151-56.
97. *Chicago Democrat*, Sept. 12, 1848, as quoted by Taylor, *Chicago Board of Trade*, 1:147.
98. On general trends in wheat prices after 1867, see Veblen, "Price of Wheat since 1867," 68-103; and Helen C. Farnsworth, "Decline and Recovery of Wheat Prices in the 'Nineties," *Wheat Studies* 10 (1933-34): 289-352.
99. Andreas, *History of Chicago*, 2:325, 333; Taylor, *Chicago Board of Trade*, 1:241, 260, 267.
100. Robert Sobel, *The Big Board: A History of the New York Stock Market* (1965), 52-53; DuBoff, "Telegraph and Structure of U.S. Markets," 262.
101. Reverend J. P. Thompson, in Curtiss, *Western Portraiture*, 334.

102. The risks of fire, shipwreck, and spoilage continued, so insurance remained a key feature of the grain trade; while grain was in transit, shippers still bore the cost of damage along the way.
103. Odle, "Entrepreneurial Cooperation," 451-53; Odle, "American Grain Trade," 9 (1953): 54-58, 105-9, 162-66.
104. Taylor, *Chicago Board of Trade*, 1:146-47; Julius B. Baer and Olin Glenn Saxon, *Commodity Exchanges and Futures Trading: Principles and Operating Methods* (1949), 3-26; Henry H. Bakken, "Historical Evaluation, Theory and Legal Status of Futures Trading in American Agricultural Commodities," in CBT, *Futures Trading Seminar: History and Development* (1960), 12-15; Emery, *Speculation on Stock and Produce Exchanges*, 38-40; James E. Boyle, *Speculation and the Chicago Board of Trade* (1920), 53-58. Jeffrey Williams argues that "to arrive" contracts were common enough at Buffalo during the late 1840s that they already constituted almost a full futures market, but I side with the older interpretation which sees "to arrive" contracts as only one of the several steps that had to be taken before a futures market could come to full flower in Chicago during the following two decades. Although "to arrive" contracts were certainly in use on the Great Lakes before the advent of grain standardization and regulated trading, the latter enormously increased market volume, which was a crucial element in making full-fledged futures possible. See Jeffrey C. Williams, "The Origin of Futures Markets," *Ag. Hist.* 56 (1982): 306-16; and Williams, *The Economic Functions of Futures Markets* (1986).
105. Small futures markets of one sort or another had existed in the past—a few European cities had been conducting them since at least the 1830s—and other American cities were experimenting with them at the same time as Chicago. But none had become so large and institutionalized as the Chicago Board of Trade by the end of the Civil War. As with the railroads, the shifting scale of the Chicago market made its grain trade look radically different from its predecessors. See CBT, *Futures Trading Seminar*, 12-16; Emery, *Speculation on Stock and Produce Exchanges*, 40-41.
106. Taylor, *Chicago Board of Trade*, 1:192-93.
107. Lee, "Chicago Grain Elevator Industry," 93; Emery, *Speculation on Stock and Produce Exchanges*, 37-38. The actual rules adopted in 1865 specified that buyers or sellers could at any time request a 10 percent margin on any future contract; that grain undelivered at the expiration of a contract would be valued at its market price on the day following; and that contracts would expire at certain uniform times of day.
108. CBT, *Annual Report for 1866*, 9; CBT, *Annual Report for 1869*, 149-50 contains the first publication of the new rules in the *Annual Report*; see also Taylor, *Chicago Board of Trade*, 1:317, 325, 331-32; and FTC, *Report on the Grain Trade* (1920), 2:107-9.
109. Emery, *Speculation on Stock and Produce Exchanges*, 46. For an excellent summary of the preconditions necessary for futures trading, see FTC, *Grain Trade*, 5:23-27.
110. The transaction between Jones and Smith is only the simplest form of such a settlement, since the trade in futures might involve a whole series of speculators who had all bought and sold from each other. Settling these complicated chains of contracts was generally done at the end of a trading day by brokers on behalf of their clients. The system was eventually formalized at Chicago in 1883, with the creation of a clearinghouse whose sole purpose was to "ring-out" differences in futures contracts. For a fuller discussion of clearinghouses and their role in the grain market, see Emery, *Speculation on Stock and Produce Exchanges*, 57-74; FTC, *Grain Trade*, 5:227ff.; and Albert C. Stevens, "'Futures' in the Wheat Market," *Quarterly Journal of Economics* 2 (1888): 40-44.
111. Morton Rothstein, "Frank Norris and Popular Perceptions of the Market," *Ag. Hist.* 56 (1982): 58.
112. The origin of these two terms is uncertain. The *Oxford English Dictionary* dates them back to at least early-eighteenth-century England, when those who sold short were sometimes called "bearskin jobbers," suggesting an allusion to the old proverb "To sell the bear's skin before one has caught the bear." "Bull" appeared somewhat later, and is more obscure in its origins.
113. Individual traders might be either bulls or bears at any given moment, though the logic and strategies of the two positions were different enough that many traders tended to specialize in one or the other.
114. *Chicago Tribune*, April 17, 1875.

115. Stevens, " 'Futures' in the Wheat Market," 51-55. Stevens gathered weekly statistics on spot and futures sales in wheat at the New York Produce Exchange during the first half of 1887, and found that the dollar volume of futures contracts amounted to about twenty times the volume of spot sales. Although he gathered no such statistics for Chicago, he did assemble them for St. Louis, where the ratio was better than 24 to 1. It seems reasonable to believe that Chicago was in the same ballpark. Indeed, Stevens thought it "well within the limits of probability" that the combined futures trading at St. Louis, Chicago, Toledo, and the major Atlantic ports of the United States during the first half of 1887 "more than equalled the total production of wheat in the world in 1886."
116. To have stated this option so explicitly would have been to declare openly that the futures contract was a wager on the future price of grain, and as such was a "gambling" contract. Gambling contracts were of dubious legal standing even before the Illinois legislature outlawed them in 1874. Because of this, the Board went to great lengths to argue—not always convincingly—that its traders really did intend to complete delivery of the grain they bought and sold. For excellent discussions of this issue, see Lurie, *Chicago Board of Trade*; and Ann Fabian, *Cord Sharps, Dream Books, and Bucket Shops: Gambling in Nineteenth-Century America* (1990).
117. At least in the years prior to 1870, corners bore some relation to the seasonal cycling of grain production, since they were easiest to run when grain was in short supply. The *Tribune* explained the phenomenon this way: "It is a singular fact that these corner operations are always made about this time of the year; just before the new crop, and when everybody is expecting lower prices. But there are good and sufficient reasons for the choice of midsummer by the schemers. Money is generally more plentiful at that season, not being wasted to move the crops, or to pay for either spring or fall trade; hence its use can be secured by the combination at less than the average cost of accommodation; then, too, there is less danger of the operation being swamped by excessive receipts, as the farmers are all too much busied with harvesting to be able to spare their men and teams to haul grain from the garner to the railroad station. Besides, the general anticipation of a decline in prices, as a consequence of the gathering in of the new crop, makes it more easy to induce parties to sell at a low figure for the future delivery, especially people in the country, who are not so well read in the details of the 'confidence game' as their city brethren." *Chicago Tribune*, July 1, 1868.
118. For a general discussion of corners and their relationship to the futures market, see FTC, *Grain Trade*, 5:322-29.
119. Andreas, *History of Chicago*, 2:362.
120. Because futures contracts relied so heavily on abundantly available and standardized grain, they were almost always written for one particular grade of medium-quality, "staple" grain. By the 1860s, spring wheat futures contracts were always for No. 2, the most common grade in the market.
121. The corner is briefly described in Ferris, *Grain Traders*, 33-34. While Lyon ran the corner in Chicago, Smith ran a parallel corner by buying up available grain in Milwaukee.
122. *Chicago Tribune*, June 24, 1868.
123. *Ibid.*, June 30, 1868.
124. *Ibid.*, July 1, 1868.
125. *Ibid.*, June 30, 1868. Not all of this \$220,000 was clear profit, of course. In order to sustain the corner, its operators had been forced to purchase "spot" wheat at inflated prices themselves, and to hold or ship that grain where other speculators could not get at it. The *Tribune* estimated that the total cost of the June 1868 corner, measured in inflated wheat prices, commissions, storage charges, and so on, was probably about \$100,000, so the operators' net gain was perhaps \$120,000.
126. *Ibid.*, July 1, 1868.
127. Andreas, *History of Chicago*, 2:362.
128. *Chicago Tribune*, July 1, 1868. Those who criticized such corners usually did so on behalf of small "legitimate" traders, not speculators. Thus, after a corner in August 1872, a Chicago-based agricultural newspaper had this to say: "No one is sorry for the swindlers of Chicago and other cities who have lost. . . . They are *not* the parties who are the real sufferers. It is the country merchants, and other grain buyers who are doing a legitimate business, who are to be pitied; and also, those in the city of Chicago,

- who pay cash for the grain they buy. Not the scalpers who have less moral feeling than brutes." "The Great Grain Corner.—Black Tuesday," *Western Rural*, Aug. 31, 1872.
129. *Chicago Tribune*, June 30, 1868.
 130. *Ibid.*, June 24, 1868, and market reports for the entire period from June 15 through June 30.
 131. *Ibid.*, July 2, 1868.
 132. *Ibid.*, July 3, 1868.
 133. On traders' fears that a corner might be run again, see *ibid.*, June 30, July 1, 4, 14, 1868.
 134. *Ibid.*, July 4, 1868.
 135. *Ibid.*, July 14, 1868.
 136. *Ibid.*, July 16, 1868.
 137. *Ibid.*, July 20, 1868.
 138. *Ibid.*, July 25, 1868.
 139. See *Chicago Tribune* market reports for Aug. 1868.
 140. Taylor, *Chicago Board of Trade*, 1:371.
 141. CBT, *Annual Report for 1869*, 164; see also Boyle, *Speculation and the Chicago Board of Trade*, 63; and Taylor, *Chicago Board of Trade*, 1:371.
 142. Frank Norris, *The Pit: A Story of Chicago* (1903; reprint, n.d.). On the inaccuracies of Norris's depiction of futures trading, see Charles Kaplan, "Norris's Use of Sources in *The Pit*," *American Literature* 25 (1953): 75-84; and Rothstein, "Frank Norris and the Market." On the Leiter corner itself, see Edward J. Dies, *The Plunger: A Tale of the Wheat Pit* (1929), 222-37; Harper Leech and John Charles Carroll, *Armour and His Times* (1938), 305-20; and Ferris, *Grain Traders*, 99-115.
 143. Lurie, *Chicago Board of Trade*, 46-49, 52-55.
 144. For individual examples of such legends, see B. P. Hutchinson, "Speculation in Wheat," *No. Am. Rev.* 153 (1891): 414-19; Charles H. Baker, *Life and Character of William Taylor Baker* (1908); Dies, *Plunger*; William Ferris, "Old Hutch—The Wheat King," *J. Ill. State Hist. Soc.* 41 (1948): 231-43; Dorothy J. Ernst, "Wheat Speculation in the Civil War Era: Daniel Wells and the Grain Trade, 1860-1862," *Wis. Mag. Hist.* 47 (1963-64): 125-35.
 145. This was the reason that the Board proposed to "solve" the corner problem by suspending the ordinary boundaries between grades, making them temporarily exchangeable in a way they never ordinarily were, so that cornered speculators could fulfill their contracts with uncornered grain.
 146. All these figures are based on 1860 statistics contained in CBT, *Annual Report for 1860*, 13, 21, and are reasonably typical. They assume a price for No. 2 spring wheat of roughly \$1.00 and for Rejected of \$.90.
 147. *Chicago Daily Press and Tribune*, July 19, 1858.
 148. Lorenzo D. Whiting of Bureau County, representing the Forty-fifth District, in *Debates and Proceedings of the Constitutional Convention of the State of Illinois* (1870), 1627.
 149. William Cary of Jo Daviess County, representing the Fifty-seventh District, in *Ill. Const. Debates*, 1622, also Samuel S. Hayes's statement, 1630; "Grain and Flour Inspection," *Prairie Farmer*, July 18, 1861.
 150. Chicago Joint Committee of the Board of Trade and Mercantile Association, *Produce and Transportation: The Railway and Warehouse Monopolies* (1866), 7.
 151. One practical source of conflict was that grain had to be graded *twice*, once at a country elevator or grain dealer and again at a Chicago elevator. Because grading was hardly an exact science, and because country inspectors did not always fully understand the Chicago system, it was not uncommon for two different grade assignments to result. (This was especially true if country buyers were competing with each other for farmers' grain, and wanted to offer the highest possible price for it.) Whenever Chicago grades proved to be lower than country grades, farmers felt they had proof positive that *someone* in Chicago was robbing them. For a helpful article that identified this problem shortly after the new grading system was created, see the letter by A. H. Loomis of Kewanee, Ill., in the *Prairie Farmer*, July 19, 1858.
 152. In the same way, farmers who produced grain whose quality was near the *lower* boundary of a grade tended to benefit at the expense of farmers whose grade was near the *upper* boundary of that grade. These effects were exacerbated when the price differentials among different grades were greater.

153. An even murkier problem was posed by elevators that installed machinery to *clean* grain so as to remove dirt and other impurities and raise it to a higher grade. In this case, elevators were legitimately *improving* the grain which had been delivered to them, but there was no easy way to determine whether the income they earned by so doing was commensurate with the work they performed. Cleaning and other processing techniques became increasingly common in the 1880s, and because traders and farmers did not want to see regular elevators earn the resulting profits for themselves, specialized warehouses gradually took over the role of doing this processing directly for paying customers. See Lee, "Chicago Grain Elevator Industry," 266-67.
154. Guy Lee cites the case of a farmer who believed he had been "filched" in this way. *Ibid.*, 76.
155. *Chicago Tribune*, Nov. 22, 1870. The *Tribune's* proposed solution was to disallow *all* mixing, even within grades, but this amounted to throwing out the baby with the bath.
156. CBT, *Report on Produce and Transportation*, 5-6. This same report was published in the *Chicago Tribune*, Feb. 14, 1866.
157. As long as grading partitioned the market for grain, *someone* was ultimately going to benefit from variation within any given grade. If the elevator operators did not appropriate it in the process of moving grain through Chicago, the millers would finally get its benefits when they milled that grain into flour. The technical difference between the two arrangements was that elevator operators who mixed would tend to bring their grain to the lowest possible level still within its grade, whereas flour millers would tend to produce a flour that reflected the midpoint of a grade.
158. CBT, *Annual Report for 1870*, 44. Many elevators also received grain from the Illinois and Michigan Canal, largely because the canal did not represent significant competition with the railroads.
159. Lee, "Chicago Grain Elevator Industry," 113-28, attempts to reconstruct the various secret agreements among elevators and railroads that allowed them to keep competition to a minimum. One of his conclusions is that Ira Munn, later known for his participation in the famous *Munn v. Illinois* court case, was the "kingpin" in a multipartnership combination which controlled about half of Chicago's total elevator space.
160. *Ibid.*, 124-26, 173. Since elevators at Buffalo assessed comparable charges, the total cost to the farmer for elevator storage and handling was more like 10 percent. Cf. "Breadstuffs and Transportation Facilities," *Hunt's Merch. Mag.* 62 (1870): 284-87.
161. "The Storage of Grain in Chicago," *Prairie Farmer*, April 9, 1864.
162. Lee, "Chicago Grain Elevator Industry," 127-28, based on income tax statements from 1863, 1865, and 1867, as reported in the *Chicago Tribune*, Jan. 17, July 18, 1865; May 2, 1867; June 9-13, 1868; and Aug. 26, 1872.
163. "The Storage of Grain in Chicago," *Prairie Farmer*, April 9, 1864.
164. CBT, *Report on Produce and Transportation*, 8.
165. The elevator operators, though themselves members of the Board, were so few in number that the Board mainly looked after the interests of the city's several hundred grain traders.
166. As early as 1858, the major elevator operators had agreed to provide the Board with daily statistics on "the quantity and grade of all grain delivered to each vessel," but this was not the same thing as the amount of grain in *store*. It was also easy to distort such figures. CBT, *Annual Report for 1858*, 12.
167. John L. Tincher of Vermilion County, representing the Thirty-ninth District, in Ill. Const. Debates, 1628.
168. Samuel S. Hayes of Cook County, representing the Fifty-ninth District, in Ill. Const. Debates, 1630.
169. Taylor, *Chicago Board of Trade*, 1:342 and 339-423 generally; Benjamin F. Goldstein, *Marketing: A Farmer's Problem* (1928), 26-31; Lee, "Chicago Grain Elevator Industry," 176, 186.
170. The Board of Trade summarized and evaluated most of these charges in its *Report on Produce and Transportation*.
171. This argument is convincingly made by Harold D. Woodman in his "Chicago Businessmen and the 'Granger Laws,'" *Ag. Hist.* 36 (1962): 16-24; for a discussion of analogous activities among Milwaukee merchants, see Dale Emory Treleven, "Commissions, Corners and Conveyance: The Origins of Anti-Monopolism in Milwaukee,"

- (M.A. thesis, Univ. of Wisconsin, 1968); and Treleven, "Railroads, Elevators, and Grain Dealers: The Genesis of Antimonopolism in Milwaukee," *Wis. Mag. Hist.* 51 (1969): 205-22.
172. Unlike their successors the Populists, the Grangers have received nothing like the attention they deserve from recent historians. Many of the most useful works on the movement are very old: Edward Winslow Martin [James Dabney McCabe,] *History of the Grange Movement*; or, *The Farmer's War against Monopolies* (1873); Jonathan Periam, *The Groundswell: A History of the Origin, Aims, and Progress of the Farmers' Movement* (1874); Arthur E. Paine, *The Granger Movement in Illinois* (1904); Solon J. Buck, *The Granger Movement: A Study of Agricultural Organization and Its Political, Economic and Social Manifestations, 1870-1880* (1913); Ernest Ludlow Bogart and Charles Manfred Thompson, *The Industrial State, 1870-1893*, vol. 4 of *The Centennial History of Illinois* (1920), 82-106; Solon J. Buck, *The Agrarian Crusade: A Chronicle of the Farmer in Politics* (1920); Henrietta M. Larson, *The Wheat Market and the Farmer in Minnesota, 1858-1900* (1926); Chester McArthur Destler, "Agricultural Readjustment and Agrarian Unrest in Illinois, 1880-1896," *Ag. Hist.* 21 (1947): 104-16; and D. Sven Nordin, *Rich Harvest: A History of the Grange, 1867-1900* (1974). On the struggle to impose state regulation on railroads via the "Granger laws," see Grosvenor, "Railroads and Farms," 591-610; Larrabee, *Railroad Question*; Frank H. Dixon, *State Railroad Control, with a History of Its Development in Iowa* (1896); Charles R. Detrick, "The Effects of the Granger Acts," *J. Pol. Econ.* 11 (1902-03), 237-56; Robert T. Daland, "Enactment of the Potter Law," *Wis. Mag. Hist.* 33 (1949): 45-54; George H. Miller, "Origins of the Iowa Granger Law," *MVHR* 40 (1954): 657-80; and George H. Miller, *Railroads and the Granger Laws* (1971).
 173. Board resolution, as reported in the *Chicago Express*, Jan. 23, 1867, as quoted in Taylor, *Chicago Board of Trade*, 1:349-50.
 174. The warehousemen also promoted an amendment outlawing futures as "void and gambling contracts," apparently to punish members of the Board who had supported elevator regulation. The clause was never enforced, and the legislature repealed it in 1869. Taylor, *Chicago Board of Trade*, 1:348-50; Lee, "Chicago Grain Elevator Industry," 161-64; Goldstein, *Marketing*, 18-26.
 175. "Farmers' Convention at Bloomington," *Western Rural*, April 28, 1870, 136; see also Periam, *Groundswell*, 229-30; Periam erroneously gives the year of this meeting as 1869.
 176. *Western Rural*, April 28, 1870, 136. Their actual resolution about elevators reads somewhat ambiguously, so the wording I quote here may actually mean that they sought the right to have grain delivered to any elevator they chose, not to no elevator at all.
 177. "The Chicago Elevators," *Chicago Tribune*, July 28, 1870.
 178. Thomas J. Turner of Stephenson County, representing the Fifty-sixth District, in Ill. Const. Debates, 1623-24. Turner appears to have been something of a laughingstock at the convention, and his arguments were not particularly coherent.
 179. James McCoy of Whiteside County, representing the Forty-eighth District, in Ill. Const. Debates, 1631.
 180. Joseph Medill of Cook County, representing the Fifty-ninth District, in Ill. Const. Debates, 1629.
 181. In the Board's original draft, this right to inspect was also given to any "board of trade" that might exist in the community where such elevators stood, but other delegates quickly struck this clause. Ill. Const. Debates, 1693.
 182. Article 13, "Warehouses," in Ill. Const. Debates, 1878. See also Goldstein, *Marketing*, 32-39.
 183. The Board fought state inspection until the early 1880s, but thereafter accepted it as inevitable. See Taylor, *Chicago Board of Trade*, 1:403, 406-13; Goldstein, *Marketing*, 36, 43-58.
 184. Goldstein, *Marketing*, 54-58.
 185. For examples of the continuing controversies surrounding elevator charges, see Baker, *Life of William Baker*, 123-30; *Chicago Conference on Trusts* (1900), 202ff.; and U.S. House of Representatives, *Report of the Industrial Commission on Transportation*, 56th Cong., 1st sess., Doc. 476, 4:7ff.
 186. Goldstein, *Marketing*, 64-96, contains a useful summary of Munn, but the literature on this case is enormous. The best recent surveys of the issues involved are Edmund W. Kitch and Clara Ann Bowler, "The Facts of *Munn v. Illinois*," in Philip B. Kurland and

- Gerhard Casper, eds., 1978: *The Supreme Court Review* (1979), 313-43; and Harry N. Scheiber, "The Road to *Munn*: Eminent Domain and the Concept of Public Purpose in the State Courts," *Perspectives in American History* 7 (1971): 327-402.
187. Goldstein, *Marketing*, 96.
 188. "Grain and Flour Inspection," *Prairie Farmer*, July 18, 1861.
 189. John Tincher, in Ill. Const. Debates, 1628.
 190. Thomas Turner, in Ill. Const. Debates, 1623.
 191. Judge Dickey in a speech at the Ottawa convention, as quoted in the *Chicago Tribune*, Feb. 21, 1866.
 192. This process, called hedging, eventually emerged as the single most powerful argument that futures trading performs a genuinely useful economic function, and is not just "gambling." But defenders of the futures market did not start to discuss hedging in this way until somewhat later in the century. For an early example, see Stevens, "'Futures' in the Wheat Market," esp. 48-51; Albert Clark Stevens, "The Utility of Speculation in Modern Commerce," *Political Science Quarterly* 7 (1892): 419-30; and Henry Crosby Emery, "Legislation against Futures," *ibid.*, 10 (1895): 62-86. For later, more technical discussions of the economics of hedging and its practical importance to the grain trade, see Alonzo E. Taylor, "Speculation, Short Selling, and the Price of Wheat," *Wheat Studies* 7 (1931): 231-66; Holbrook Working, "Financial Results of Speculative Holding of Wheat," *ibid.*, 405-37; Truman F. Graf, "Hedging—How Effective Is It?" *Journal of Farm Economics* 35 (1953): 398-413; Holbrook Working, "Hedging Reconsidered," *ibid.*, 544-61; and Williams, *Economic Functions of Futures Markets*.
 193. Samuel S. Hayes, in Ill. Const. Debates, 1630. There was a deeper change here as well: the Board symbolized the farmers' growing dependence on cash transactions to sustain the rural economy. "In former years," wrote a reporter for Chicago's *Western Monthly*, "when the producers were less numerous and the aggregate of their surplus but small, the farmer could make his exchanges direct with the grocer, dry goods dealer, or other trader. But, with the systematizings of modern commerce, these duplex operations are no longer convenient or profitable; in other words, they are rendered impossible. 'Cash' is now the only recognized means of purchase for land, improvements, labor, furniture, or goods; and the farmer must sell his grain and live stock for cash." "The Chicago Board of Trade," *Western Monthly* 3 (1870): 406.
 194. CBT, *Annual Reports*, 1871-80.
 195. William Cary, in Ill. Const. Debates, 1623. On later controversies surrounding speculation at the Board of Trade and elsewhere, see Cedric B. Cowing, *Populists, Plungers, and Progressives: A Social History of Stock and Commodity Speculation, 1890-1936* (1965).
 196. "A prerequisite to the development of future trading . . . is homogeneity in the commodity dealt in, such that commercial units are interchangeable. . . . A system of grading much increases the availability of grain in this respect for future trading." FTC, *Grain Trade*, 5:24.
 197. Orlando H. Wright, in Ill. Const. Debates, 1636. Wright's confusion is evident even in his misquotation of Board vocabulary: one does not sell long, only short.
 198. "Metropolis of the Prairies," 727.
 199. CBT, *Annual Report for 1875*, 22.
 200. Cf. *Origin, Growth, and Usefulness of the Chicago Board of Trade* (1885), 62: "These figures [of Chicago grain shipments] demonstrate that the Board of Trade of the city of Chicago does not deal in fictions, for if there should be removed from the world's supplies for one year these vast quantities of grain and provisions, want and hunger and famine, most positive and real, would follow, which would be no fictions, but realities of the most deplorable and calamitous character."

4: THE WEALTH OF NATURE: LUMBER

1. Wright, *Chicago*, xiii.
2. Karl Marx, *Capital: A Critique of Political Economy*, vol. 2 (1885; reprint, 1967), 105. David Fernbach translates this phrase as "self-valorizing value" in his edition of *Capital*, vol. 2 (1978), 185, emphasizing the extent to which capital seems to act "with the force of an elemental natural process," a theme I emphasize throughout this book.
3. "What exclusively determines the magnitude of the value of any article is therefore the