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Machines On The Farm: Capitalism And Technology In Midwestern Agriculture, 1845-1900

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Machines on the Farm:
Capitalism and Technology in Midwestern Agriculture, 1845-1900

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A Dissertation presented to the Graduate Faculty of The College of William &
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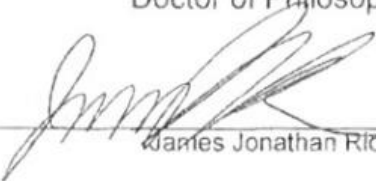
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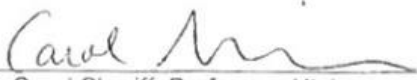
Doctor of Philosophy


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ABSTRACT

Farming people in the Midwestern United States and in Ontario began using new machines throughout the second half of the nineteenth century. These included machines related to the production of grain crops—including threshers, reapers, and drills—as well as machines related to the production of the farm household—such as sewing and washing machines. In their use, maintenance, and alteration of machines within the natural and social contexts of their farms, rural people produced new technological systems of industrial agriculture. They also struggled with machine manufacturers and their agents for control of those systems—both as individuals and through farmers' organizations. *Machines on the Farm* contributes to historiographies of capitalism, technology, and agriculture as it demonstrates the importance of knowledge, maintenance, and tinkering on the farm to the mechanization of grain agriculture.

Machines on the Farm follows the production and maintenance of, as well as the struggle over, the technological systems of mechanized grain farming from the introduction of horse-powered machines in the middle decades of the century to the end of the century, when those machines had become indispensable and central parts of farms themselves. Over that time, farming people became more dependent on the large-scale production of wheat and turned to further mechanization to sustain their operations. Their dependence on wheat production, the increased complexity of machines, farmers' reliance on replacement parts, and the efforts of manufacturers and their agents to assert themselves as authorities over industrial agriculture left the technological agency of farming people diminished.

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Introduction

Hugh Orchard and his brothers looked forward to the day when they would be old enough to participate in the heavier tasks of farm work. In a memoir of his youth on an Iowa farm in the 1880s, Orchard wrote, “It was a big day for us boys when we began to actually get a hand in the farm work—especially handling the horses.” He continued, “we worked up a little at a time until the day finally came when we could actually hitch up a team to a plow and do work in the fields. That was what every country boy looked forward to.” The Orchard boys eagerly awaited the moment in which they would be able to fully take on the role of producers in the field. Yet even as the boys grew, there were some horse-drawn tasks that their father insisted on directing himself. Orchard further recalled that “Pap always drove the mowing machine since he claimed to be a mechanic. He made out that it took quite a genius to handle the harvesting machinery.”¹ Orchard’s father knew that the management of mechanical mowers, reapers, threshers, and seed drills was a difficult task, and he evidently took pride in his ability to handle them. The pride that Hugh Orchard aspired to through participation in farm production and the pride that his father felt in command of machinery were of similar origin and significance. Pride in production and pride in the use of machinery were intertwined because the task

¹ Hugh Orchard, *Old Orchard Farm* (Ames: Iowa State College Press, 1952), 149-151.

of producing on the farm was intertwined with the task of producing the mechanical systems of the farm.

This dissertation traces the contributions of farming people to the mechanization of grain agriculture in the Midwestern United States and Ontario. Over these decades, farming people began using machines in many of the most important aspects of farming small grains like oats, barley, rye, and especially wheat. They also used mowing machines—quite similar in design to the reapers that cut grain—when harvesting grasses for hay. They brought machines into the farming household as well. Rural populations embraced sewing and washing machines in the same decades as field machines. They made those devices constituent parts of the technological systems of the grain farm in which many mechanical, human, and animal components were united and directed towards the production of grain.

As farming people embraced and adapted these new machines, they produced technological systems of mechanized agriculture and brought industrial capitalism to the rural Midwest. Farming people possessed little control over the price of wheat, or over the financial systems that determined how, and if, they came to acquire land or whether they could keep it. In many ways, their labor, with and without machines, was exploited by financial and mercantile capitalists. But farming people were central agents in the production of the industrial side of capitalist agriculture. They built and maintained technological systems that allowed them to cultivate larger fields and to harvest greater

quantities of grain. They transformed land, labor power, animals, and machines into commodified components of those systems.

Farming people built these systems in the context of two countervailing and interrelated influences in American life as described by Thorstein Veblen—himself a product of Midwestern farms. First, farming people channeled and pursued what Veblen called the “instinct of workmanship.”² Nineteenth-century Americans saw productive labor as the root of value and a source of identity and pride. They combined this producerist ideology with the knowledge necessary to make mechanized farm systems work. Yet farming people did not bring industrial methods of production to agriculture in circumstances of their own choosing. When farming people moved further west, took on mortgages, dedicated their production to the commodity-crop wheat, and capitalized their farms with new machines, they participated in the development of industrial capitalism. They thus entered further into a world characterized by the pecuniary instincts and institutions that Veblen describes in *The Theory of the Leisure Class* and in *The Theory of Business Enterprise*.³ Veblen saw those instincts embodied in the drive for profit derived not from labor, but from victory in the market, and he connected those instincts to predation in the natural world. Pecuniary instincts existed in tension, and sometimes conflict, with the instinct of workmanship. Yet farmers engaged with both as they

² Thorstein Veblen, “The Instinct of Workmanship and the Irksomeness of Labor,” *American Journal of Sociology* 4 (September 1898): 187–201.

³ Thorstein Veblen, *The Theory of the Leisure Class* (New York: Dover, 1994) [first published 1899]; Thorstein Veblen, *The Theory of Business Enterprise* (Blackmask Online, 1999) [originally published 1904]. For more on Veblen’s thought and background, see also Charles Camic, *Veblen: The Making of an Economist Who Unmade Economics* (Cambridge: Harvard University Press, 2020).

augmented the productivity of their farms with new machines. By the end of the nineteenth century, farming people made grain agriculture both capitalist and industrial.

They developed industrial capitalism on the farm over a period of decades. In the middle of the century, farmers had to make machines work within their extant systems of farm life. They engaged with the market through the purchase of machines and the sale of wheat, but they also pursued traditional goals of landed independence and the reproduction of the farming household. Yet farmers tuned their systems of mechanized agriculture to maximize yield and profit out of the materials available—as well as out of those materials only available via credit, including machines. As farmers continued to pursue landed independence in a difficult financial landscape, they built farm systems that helped them draw as much value as possible out of the land, labor, and animals under their command. By the end of the century, increased reliance on wheat production in the midst of fluctuating prices and tight credit left farmers dependent on machines to sustain their operations. Machines themselves had become a central part of making a living in capitalist agriculture.

This dissertation endeavors to chronicle how rural people built and maintained their industrializing farms over the second half of the nineteenth century. It also seeks to demonstrate how farming people, like other laborers in industrializing America, struggled for control over the technological systems of industrial capitalism that they had wrought. In their conflicts with machine manufacturers—both as individuals and through organizations like the Patrons of Husbandry and Farmers' Alliances—farming people

asserted their own claims as producers to the mechanical world. Their ability to do so, however, was hampered by their dependence on external financial systems, as well as by their dependence on machine manufacturing companies for maintenance. Manufactures produced, and farmers purchased, machines that were more complicated and more expensive in the latter decades of the century. Farmers became dependent on manufacturers' agencies and experts, especially for replacement parts, and their own command of the technological systems of industrial grain farming diminished.

“The Choice of the Multitude:” Grain Agriculture and Industrial Capitalism

The growth of industrial capitalism in grain farming was a central process in the development of American capitalism in the nineteenth century. Grain farmers in the Midwestern states of Ohio, Indiana, Michigan, Illinois, Wisconsin, Minnesota, Iowa, Nebraska, Kansas, and the Dakotas participated directly in that transformation by reaping both food and profit from the land. From 1840 to 1860, the Midwest went from producing 32.4 per cent of the wheat output of the United States to 54.9 per cent. In the same two decades, the total U.S. wheat output nearly doubled from 84,823,000 bushels to 173,105,000 bushels.⁴ The capitalization and industrialization of grain farming that made this growth possible was built on the technological systems that were constructed by farming people.

⁴ Percy Wells Bidwell and John I. Falconer, *History of Agriculture in the Northern United States, 1620-1860* (New York: Peter Smith, 1941), 323.

This half century was also that in which wheat challenged cotton for primacy as the cash crop of the United States, and perhaps of North America as a whole.⁵ Southern cotton agriculture—capitalist in its commercial and financial aspects and in its drive to wring quantified labor productivity out of enslaved people, if not in the social relations between enslavers and enslaved people—was perhaps at the forefront of agricultural capitalization in the first half of the century.⁶ The development of the mechanical reaper itself has some roots in the context of international relationships between the producers of wheat in Cyrus McCormick’s Virginia and the producers of other cash crops like cotton and coffee both within and beyond the United States.⁷ Nevertheless, many Northern farmers also placed the pursuit of profit at the center of their efforts to know and alter the natural world in the first half of the century.⁸ During and after the Civil War, Midwestern

⁵ Scott Reynolds Nelson, *Oceans of Grain: How American Wheat Remade the World* (New York: Basic Books, 2022).

⁶ On the international conditions that hindered the place of cotton as a primary export crop in the second half of the century, see, Sven Beckert, *Empire of Cotton: A Global History* (New York: Vintage Books, 2015); On the financial capitalism that surrounded slavery and cotton production in the nineteenth-century American South, see, Calvin Schermerhorn, *The Business of Slavery and the Rise of American Capitalism, 1815-1860* (New Haven: Yale University Press, 2015). For the classic argument against the idea of antebellum slave agriculture as capitalist, see, Eugene D. Genovese, *Roll, Jordan, Roll: The World the Slaves Made* (New York: Vintage Books, 1976); On the commodification and exploitation of quantified and managed enslaved labor, see, Daina Ramey Berry, *The Price For Their Pound of Flesh: The Value of the Enslaved, from Womb to Grace, in the Building of a Nation* (Boston: Beacon Press, 2017); Caitlin Rosenthal, “From Slavery to Scientific Management,” in *Slavery’s Capitalism: A New History of American Economic Development*, ed. Sven Beckert and Seth Rockman (Philadelphia: University of Pennsylvania Press, 2016); Caitlin Rosenthal, *Accounting for Slavery: Masters and Management* (Cambridge: Harvard University Press, 2018); Walter Johnson, *River of Dark Dreams: Slavery and Empire in the Cotton Kingdom* (Cambridge, MA: Harvard University Press, 2013); Edward E. Baptist, *The Half Has Never Been Told: Slavery and the Making of American Capitalism* (New York: Basic Books, 2014); Walter Johnson, *Soul By Soul: Life Inside the Antebellum Slave Market* (Cambridge, MA: Harvard University Press, 1999).

⁷ Daniel B. Rood, *The Reinvention of Atlantic Slavery: Technology, Labor, Race and Capitalism in the Greater Caribbean* (Oxford: Oxford University Press, 2017), 174-196.

⁸ Emily Pawley, *The Nature of the Future: Agriculture, Science, and Capitalism in the Antebellum North* (Chicago: University of Chicago Press, 2020).

wheat came to the fore of agricultural improvement and maximization. After the abolition of slavery and the introduction of competing cotton producers in world markets, the comparative advantages of wheat as an American commodity crop were apparent.

As farming people established farms in the western parts of the Midwest and Canada, they typically became more dependent on external markets than they had been in eastern regions. Farmers in eastern regions could provide many of their household needs from their own production, but as farmers went further west throughout the century, they depended more on financial mechanisms to purchase land, on railroads to ship their goods to market, on the purchase of basic necessities as consumers, and on machinery for production. Many western farmers also turned to the production of wheat in order to pay land expenses and to make their own profits. An English immigrant to Iowa wrote, “The growing of grain bringing in quicker results, naturally appealed more to those whose resources were limited, and the number of wagons on the street laden with bags of grain testified to the fact that grain was the choice of the multitude.”⁹ Wheat thus became both a central crop of agricultural capitalism as well as an economic necessity for the efforts of common farmers to achieve and preserve landed independence. As the Midwest became a wheat-producing region, its farmers gradually became dependent on the sale of the crop, and thus also on the mechanization of their farms to augment production.

There have been robust historiographical debates about the extent to which industrial capitalism was contested or completed at various points in the nineteenth

⁹ Harcourt Horn, *An English Colony in Iowa* (Boston: Christopher Publishing House, 1931), 55.

century. U.S. agricultural histories of the mid-twentieth century presented a version of this story in which farming people embraced and benefited from capitalization and mechanization.¹⁰ Canadian agricultural histories presented a similar story in a country whose westward expansion of agriculture brought a similar increased reliance on external markets and capitalist development.¹¹ Later decades brought debates about how thoroughly farming communities embraced profit-seeking, connection to markets, and mechanical capitalization.¹² Scholars of the “new” rural history have identified resistance

¹⁰ Bidwell and Falconer, 218-305; Paul Gates. *The Farmer's Age: Agriculture, 1815-1860* (New York: Holt, Reinhart, and Winston, 1960). 279-294; Gilbert C. Fite. *The Farmer's Frontier, 1865-1900* (New York: Holt, Reinhart, and Winston, 1966); Alan Bogue. *From Prairie Belt to Corn Belt: Farming on the Illinois and Iowa Prairies in the Nineteenth Century* (Chicago: University of Chicago Press, 1963), 152-159; Clarence Danhof, *Change in Agriculture: The Northern United States, 1820-1870* (Cambridge: Harvard University Press, 1969); Fred A. Shannon. *The Farmer's Last Frontier: Agriculture, 1860-1897* (New York: Routledge, 1977), 134-147; Jeremy Atack, and Fred Bateman. *To Their Own Soil: Agriculture in the Antebellum North* (Ames: Iowa State University Press, 1987), 194-200; Peter McClelland, *Sowing Modernity: America's First Agricultural Revolution* (Ithaca: Cornell University Press, 1997).

¹¹ James Lemon, *The Best Poor Man's Country* (Baltimore: Johns Hopkins University Press, 1972). For a comprehensive review of this literature, see Peter A. Russel, *How Agriculture Made Canada* (Kingston, Ontario: McGill Queens University Press, 2012).

¹² The literature on this subject and debate is extensive. Much of the debate concerns the late eighteenth century and the first half of the nineteenth century as a period of transition in the British North American colonies and the United States. See, Allan Kulikoff, “The Transition to Capitalism in Early America,” *William and Mary Quarterly* 46, no. 1 (January 1989): 120–44; Charles Sellers, *The Market Revolution: Jacksonian America* (New York: Oxford University Press, 1991); Michael Merrill, “Putting ‘Capitalism’ in Its Place: A Review of Recent Literature,” *William and Mary Quarterly* 52, no. 2 (April 1995): 315–26; Michael Merrill, “Cash Is Good to Eat: Self-Sufficiency and Exchange in the Rural Economy of the United States,” *Radical History Review* 4 (1977): 42–71. Michael Merrill, “The Anticapitalist Origins of the United States,” *Review (Fernand Braudel Center)* 13, no. 4 (Fall 1990): 465–97; Winifred Rothenberg, “The Market and Massachusetts Farming, 1730-1855,” *Journal of Economic History* 41, no. 2 (June 1981): 281–314. Joyce Appleby, “Commercial Farming and the ‘Agrarian Myth’ in the Early Republic,” *Journal of American History* 68 (1982): 833–42; Naomi R. Lamoreaux, “Rethinking the Transition to Capitalism in the Early American Northeast,” *Journal of American History* 90 (2003): 437–61. For extensive studies of the development of rural capitalism over this larger time span, see, Allan Kulikoff, *The Agrarian Roots of American Capitalism* (Charlottesville: University of Virginia Press, 1992); Christopher Clark, *The Roots of Rural Capitalism: Western Massachusetts, 1780-1860* (Ithaca: Cornell University Press, 1990); Christopher Clark, “The Agrarian Context of American Capitalist Development” in Michael Zakim and Gary Kornblith eds. *Capitalism Takes Command: The Social Transformation of Nineteenth-Century America* (Chicago: University of Chicago Press, 2012). For similar debates within the historiography of Canada before the middle of the nineteenth century, see, Catherine Desbarats, “Agriculture within the Seigneurial Regime of the 18th Century: Some Thoughts on Recent Literature” 73, no. 1 (1992): 1–29; Ruth Sandwell, “Rural

to both capitalism and modernization among farming people who acted with priorities different from the maximization of production and profits.¹³ Ronald Kline even argues that resistance to farm modernization continued through the first half of the twentieth century, though he restricts modernization to electrical power and automobiles rather than horse-drawn machines.¹⁴ Nevertheless, while the process of capitalization was contested, most Midwestern farmers, like farmers throughout the country, were thoroughly embedded in capitalism by the end of the century.

Although *Machines on the Farm* tells a story of capitalist transformation, it is important to note that farming people did not always, or even often, see themselves as champions of “capitalism” as it is understood in the twentieth and twenty-first centuries. As Joyce Appleby notes of earlier social and cultural developments, Americans made decisions based on their own contexts and could not know that those decisions would lead to the social and economic relationships that later became typical of capitalism.¹⁵ In

Reconstruction: Toward a New Synthesis in Canadian History,” *Historie Sociale / Social History* 27, no. 53 (May 1994): 1–32.

¹³ Robert P. Swierenga, “Theoretical Perspectives on the New Rural History: From Environmentalism to Modernization,” *Agricultural History* 56, no. 3 (July 1982): 495–502; John Mack Faragher, *Sugar Creek: Life on the Illinois Prairie* (New Haven: Yale University Press, 1986); Jane Adams, *The Transformation of Rural Life: Southern Illinois, 1890-1990* (Chapel Hill: University of North Carolina Press, 1994); Hal. S. Barron, *Mixed Harvest: The Second Great Transformation in the Rural North, 1870-1930* (University of North Carolina Press, 1997); Mary Neth, *Preserving the Family Farm: Women, Community, and the Foundations of Agribusiness in the Midwest, 1900-1940* (Baltimore: Johns Hopkins University Press, 1995). Agricultural historians of the U.S. South have made similar arguments about the contestation of capitalism and modernity. See, for instance, Jack Temple Kirby, *Rural Worlds Lost: The American South, 1920-1960* (Baton Rouge: Louisiana State University Press, 1986); Donna A. Barnes, *Farmers in Rebellion: The Rise and Fall of the Southern Farmers Alliance and the People’s Party in Texas* (Austin: University of Texas Press, 1984).

¹⁴ Robert R. Kline, *Consumers in the Country: Technology and Social Change in Rural America* (Baltimore: Johns Hopkins University Press, 2000).

¹⁵ Joyce Appleby, *Capitalism and a New Social Order: The Republican Vision of the 1790s* (New York: New York University Press, 1984), 43-50.

their pursuit of landed independence, farming people relied on capitalist markets and finance. They also industrialized their productive operations. In the latter decades of the century in particular, the demands of making a living through the production and sale of wheat left them little choice but to use machines and increase acreage.

Recent histories that track the growth of nineteenth-century capitalism—often referred to as the “New Histories of Capitalism”—have emphasized the commercial, financial, and abstract side of agrarian capitalism. In doing so, however, they have, in effect, taken labor and production out of capitalism. When the concept of technology appears, it often does so in the form of “paper technologies” that facilitated economies of cash and credit—including the mortgages through which farmers purchased land.¹⁶ It is important to put production and technology back at the center of studies of nineteenth-century capitalism. We can then see, for instance, that farming people expressed agency much more directly on the side of production than on the side of commerce and finance. This population of people, who took pride in their membership among the “producing

¹⁶ Jonathan Levy, “The Mortgage Worked the Hardest: The Fate of Landed Independence in Nineteenth-Century America,” in *Capitalism Takes Command: The Social Transformation of Nineteenth Century America*, ed. Michael Zakim and Gary Kornblith (Chicago: University of Chicago Press, 2012), 39–68, as well as the other contributions to that collected volume. See also Michael Zakim, *Accounting for Capitalism: The World the Clerk Made* (Chicago: University of Chicago Press, 2018); Jonathan Levy, *Ages of American Capitalism: A History of the United States* (New York: Random House, 2021). For historiographical essays and other commentaries that highlight the tendency of the “new historians of capitalism” to underestimate the place of machines and industry in the emergence of capitalism, see “Forum: Paper Technologies of Capitalism,” *Technology and Culture* 58, no. 2 (April 2017); Jeffrey Sklansky. “The Elusive Sovereign: New Intellectual and Social Histories of Capitalism.” *Modern Intellectual History* 9, no. 1. (March 2012): 233-248; Merritt Roe Smith and Robert Martello. “Taking Stock of the Industrial Revolution in America.” In *Reconceptualizing the Industrial Revolution*. Jeff Horn, Leonard N. Rosenbrand, and Merritt Roe Smith eds. (Cambridge, MA: MIT Press, 2010), 169-200; Jean-Christophe Agnew. “Afterward: Anonymous History” in *Capitalism Takes Command*. Gary Kornblith and Michael Zakim eds. (Chicago: University of Chicago Press 2011), 277-284.

classes,” were more drivers of industrialization than of commercialization, even as those processes were intimately related. Compelled by the external forces of commodity prices and mortgage terms they had little individual control over, Midwestern farmers turned to the realm of production and built technological systems that brought industrial capitalism to grain farming, even if their added production only contributed to precarious changes in grain prices and thus their further dependence on the maximization of its production.

Farming people industrialized grain agriculture in the nineteenth century. Deborah Fitzgerald argues that twentieth-century farmers, alongside a class of industry and government professionals, promoted industrialization not only in the form of mechanization, but also as an intellectual project of rationalization and maximization. The efforts of these farmers and professionals to make every farm into a factory compromise one chapter of how nineteenth-century small farms gave way to the “agribusiness” of the twentieth century.¹⁷ This dissertation provides a chapter before this, in which the mechanical groundwork for agricultural industrialization was laid not by industry professionals and government experts, but by farming people themselves as they sought security and profit in the context of nineteenth-century capitalism.¹⁸

¹⁷ Deborah Fitzgerald, *Every Farm a Factory: The Industrial Ideal in American Agriculture* (New Haven: Yale University Press, 2003).

¹⁸ For classic studies of American industrialization beyond the realm of agriculture, see, John Habakkuk, *American and British Technology in the Nineteenth Century: The Search for Labour-Saving Inventions* (Cambridge University Press, 1962); Nathan Rosenberg, *Technology and American Economic Growth* (Armonk, New York: M.E. Sharpe, 1972). See also Smith and Martello, “Taking Stock of the Industrial Revolution in America,” for a more recent discussion of the historiography on nineteenth-century American industrialization.

Where this dissertation argues that farming people were central to the production of mechanized agriculture, the historiography of agricultural mechanization has generally cast farmers as secondary contributors. In their accounts of mechanization, agricultural historians have largely written about farmers as consumers and about machines as manufactured products.¹⁹ Economic historians focus on the consumer relationship as well, though they acknowledge farmers as producers in this context by considering machines as productive inputs.²⁰ J. Sanford Rikoon's *Threshing in The Midwest* is perhaps the best example of a social history of the rural Midwest that casts farming people as agents of technological change. Rikoon gives rural people credit for creating mechanized systems of threshing that worked in the context of their social and natural worlds, although he assigns that credit largely to a minority within rural communities of travelling threshermen who took on roles that required technical expertise.²¹

The business historiography of machine manufacturers also considers farmers primarily as consumers, rather than as producers, of mechanization. The early historiography of the nineteenth-century farm machine industry was inaugurated by debates about which great individual deserved credit for invention—particularly the

¹⁹ In addition to the literature cited above, see, David Blanke, *Sowing the American Dream: How Consumer Culture Took Root in the Rural Midwest* (Athens, OH: Ohio University Press, 2000), which makes the argument for farmers as consumers most directly.

²⁰ See, for instance, Paul A. David. "The Mechanization of Reaping in the Ante-Bellum Midwest." In *Industrialization in Two Systems: Essays in Honor of Alexander Gerschenkron*, edited by Henry Rosovsky. New York: Wiley, 1966.

²¹ J. Sanford Rikoon, *Threshing in the Midwest, 1820-1940: A Study of Traditional Culture and Technological Change* (Bloomington: Indiana University Press, 1988).

invention of the mechanical reaper.²² Later historians of business and industrialization, including David Hounshell and Gordon Winder, provide a more sophisticated image of the industry that is inspired by similar shifts in the history of technology away from the hagiography of great inventors to the consideration of multiple agents of change.

Hounshell, Winder, and others explore how machines were manufactured and how innovation emerged from complex networks of different firms rather than from individuals.²³ Early histories of the American sewing machine industry were likewise concerned with the contested legacies of inventors who acted as progenitors of leading manufacturers.²⁴ Later scholars likewise provided more sophisticated views of the industry and the conflicted paths of innovation within it.²⁵ Yet scholars of these industries

²² William T. Hutchinson, *Cyrus Hall McCormick: Seed-Time, 1809-1856* (New York: The Century Co., 1930); William T. Hutchinson, *Cyrus Hall McCormick, Harvest, 1856-1884* (New York: Century Company, 1935); John F. Steward and Arthur Pound, *The Reaper: A History of the Efforts of Those Who Justly May Be Said to Have Made Bread Cheap* (New York: Greenberg, 1931); Cyrus Hall McCormick Jr., *The Century of the Reaper* (New York: Houghton Mifflin Company, 1931); Norbert Lyons, *The McCormick Reaper Legend: The True Story of a Great Invention* (New York: Exposition Press, 2008); 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* (Berkeley: University of California Press, 1931). Daniel Ott, "Producing a Past: Cyrus McCormick's Reaper from Heritage to History" PhD. Dissertation, (Chicago, Loyola University, 2015), argues that this early historiography, and indeed the early historical profession in the United States, was profoundly shaped by the patronage of parties with an interest in particular claims to the invention of the mechanical reaper.

²³ David Hounshell, *From the American System to Mass Production, 1800-1932* (Baltimore: Johns Hopkins University Press, 1984), 153-188; Gordon M. Winder, *The American Reaper: Harvesting Networks and Technology, 1830-1910* (New York: Routledge, 2016); Rood, *The Reinvention of Atlantic Slavery*, 174-196; Sterling Evans, *Bound in Twine: The History and Ecology of the Henequen-Wheat Complex for Mexico and the American and Canadian Plains, 1880-1950* (College Station, TX: Texas A&M University Press, 2007); For more on questions of innovation and technological agency within the historiography of technology, see the following section of this dissertation.

²⁴ James Parton, *History of the Sewing Machine* (Boston: The Howe Machine Company, n.d.), defends the claims of Elias Howe as preeminent inventor of the American sewing machine. It was published in the *Atlantic Monthly* in May 1867 and was also printed by the company on its own with advertising; Singer Sewing Machine Company, *Genius Rewarded or The Story of the Sewing Machine* (New York: John J. Caulon, 1880), provides the case for Isaac M. Singer and his company.

²⁵ Andrew B. Jack, "The Channels of Distribution for an Innovation: The Sewing-Machine Industry in America, 1860-1865," *Explorations in Entrepreneurial History* 9, no. 3 (February 1957): 113-41; Ruth

leave the other side of the production of technology on the farm unexplored and deal with farmers as passive consumers. They have not delineated the extent to which mechanized systems could only exist when they were made to work in concert with extant systems of farm production. Olivier Zunz briefly argues that farmers contributed to the innovative activities of the McCormick Harvesting Machine Company by providing feedback, but nonetheless treats the company men as the driving force of the relationship.²⁶ This dissertation seeks to identify farming people as a driving force of their own in the industrialization of agriculture.

The profits of this industrialization, however, did not flow solely, or even in large part, to farming people. Leo Rogin's study of the effect of different machines on labor productivity attests that these machines did, in fact, save farmers time and also reduced farmers' reliance on hired agricultural laborers—perhaps helping one part of the agricultural population at the expense of another.²⁷ The effects of mechanization on the profitability of individual family farms are less obvious. Farmers used machines to expand their acreages of wheat production and to harvest greater quantities of this cash crop. Yet the fluctuating—and, after 1873, often falling—price of wheat made the

Brandon, *A Capitalist Romance: Singer and the Sewing Machine* (Philadelphia: J.B. Lippincot, 1977); Grace Rogers Cooper, *The Sewing Machine: Its Invention and Development* (Washington: Smithsonian Institution Press, 1976); Frank P. Godfrey, *An International History of the Sewing Machine* (London: Robert Hale, 1982); Marguerite A. Connolly, "The Transformation of Home Sewing and the Sewing Machine in America, 1850-1929" PhD. Dissertation, (Newark, DE, University of Delaware, 1994); Wendy Gambler, *The Female Economy: Dressmaking Trades, 1860-1903* (Champaign: University of Illinois Press, 1997).

²⁶ Olivier Zunz, *Making America Corporate* (Chicago: University of Chicago Press, 1990).

²⁷ 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* (Berkeley: University of California Press, 1931).

expansion of field sizes more of an effort to catch up to the market than an effort to get ahead of it. Moreover, expanded wheat production, both in the United States and elsewhere in the world, only pushed prices down. A similar dynamic to the one in which farmers mechanized to keep up with competitors who were also growing more and more wheat with the help of machines has been described as a feature of capitalist production as early as in Karl Marx's analysis of machinery and large-scale industry.²⁸ As farmers expanded, mechanized, and capitalized their operations, many wheat farmers failed while others succeeded in what proved to be a precarious business.

Not unlike other populations of workers who experienced industrial revolutions, Midwestern farmers saw their labor with machines turned into vast wealth without receiving what they considered their fair share of that wealth. Also not unlike those other populations of workers, farmers engaged in conflict with those to whom the wealth they produced through new technological systems seemed to flow. While these adversaries included railroad and financial capitalists, machine manufacturers proved to be the farmers' principal adversary in conflicts that were about machines. When farmers struggled with manufacturers, they did so as producers. Like artisan laborers who struggled in those same years to control the shop floor, farmers struggled to retain command of the technological systems of production on their farms.²⁹

²⁸ "Machinery and Large-Scale Industry" in Karl Marx, *Capital Volume 1*, trans. Ben Fowkes (Middlesex, England: Penguin, 1976), 492-639.

²⁹ David Montgomery, *Workers' Control in America: Studies in the History of Work, Technology, and Labor Struggles* (Cambridge: Cambridge University Press, 1979); Bruce Laurie, *Artisans Into Workers: Labor in Nineteenth-Century America* (Urbana: University of Illinois Press, 1997).

Farming people sought to direct the technological systems they built. Daniel Ott has elucidated the cultural and ideological stakes of their conflicts with manufacturers from the perspective of manufacturers, who sought to assert their own responsibility for the mechanization of agriculture against the producerist challenges of both farmers and their own hired factory workers.³⁰ Indeed, McCormick—the largest farm machine manufacturer of the time—faced challenges from its factory labor throughout the same decades in which farmers asserted their own claims.³¹ Farming people themselves contested for control over, and the fruits of, technological systems in the context of precarious economic conditions before the Panic of 1873, and in deteriorating economic conditions afterwards. In the final quarter of the century, lack of credit, unstable crop prices, and mortgage payments forced farmers to rely even further on the mechanized systems they helped produce.³² The same conditions tightened manufacturers profits and primed them to struggle for control over mechanized grain agriculture through the end of the century.

Historiographies of the farmers' movements of the nineteenth-century Midwest have tended to see their conflicts with manufacturers as those between the producers and consumers of machines. Consumer politics was a force in American social and political life, even in the eighteenth and nineteenth centuries, and to a greater extent in the

³⁰ Daniel Ott, "Producing a Past," PhD Dissertation; Daniel Ott, "Producing a Past: McCormick Harvester and Producer Populists in the 1890s," *Agricultural History* 88, no. 1 (January 2014): 87–119.

³¹ Robert W. Ozanne, *A Century of Labor-Management Relations at McCormick and International Harvester* (1967: University of Wisconsin Press, 1967).

³² Levy, *Ages of American Capitalism*, 55-74.

twentieth century after the emergence of mass production and cultural forms of consumerism.³³ David Blanke, in *Sowing the American Dream*, argues that nineteenth-century farmers' organizations like the Patrons of Husbandry were engaged in consumer politics. Blanke even points to the purchase of farm machines—from mechanical reapers to sewing machines—as an instigating factor in the development of a consumer culture in the rural Midwest.³⁴ The mechanization of grain agriculture certainly contributed to the growing list of things that nineteenth-century farmers purchased for their households. Farming people did act as consumers to a greater extent than before by purchasing many and different types of machines from manufacturers and their travelling sales agents. Yet farming people understood these machines as pieces of production, and these machines contributed directly to their productive activities.

Nineteenth-century Americans, and especially nineteenth-century farmers, understood themselves as producers first and consumers second. These producerist identities were rooted in the liberal and republican ideologies of the century.³⁵ Cultural

³³ Cary Carson, “The Consumer Revolution in Colonial British America: Why Demand?,” in *Of Consuming Interests: The Style of Life in the Eighteenth Century* (Charlottesville: University Press of Virginia, 1992), 483–697; William Leach, *Land of Desire: Merchants, Power, and the Rise of a New American Culture* (New York: Vintage Books, 1994); T.J. Jackson Lears, *Fables of Abundance: A Cultural History of Advertising in America* (Basic Books: New York, 1994); James Livingston, *Pragmatism and the Political Economy of Cultural Revolution, 1850-1940* (Chapel Hill: University of North Carolina Press, 1997); Lizabeth Cohen, *A Consumer's Republic: The Politics of Mass Consumption in Postwar America* (New York: Vintage, 2003); Charles F. McGovern, *Sold American: Consumption and Citizenship* (Chapel Hill: University of North Carolina Press, 2006).

³⁴ Blanke, *Sowing the American Dream*.

³⁵ Daniel T. Rodgers, *The Work Ethic in Industrial America, 1850-1920* (Chicago: University of Chicago Press, 1974); Daniel T. Rodgers, “Republicanism: The Career of a Concept,” *The Journal of American History* 79, no. 1 (June 1992): 11–38; Joyce Appleby, *Liberalism and Republicanism in the Historical Imagination* (Cambridge: Harvard University Press, 1992); Howard P. Segal, *Technological Utopianism in American Culture* (Syracuse: Syracuse University Press, 2005).

historians have demonstrated how machines were symbolically connected to these ideologies through ideas of progress and productive labor.³⁶ Nineteenth-century wage workers and labor organizations often framed their conflicts as between producers and non-producers rather than between wage-earners and employers.³⁷ The importance of producerist ideology to farmers' identities and social movements has also been noted.³⁸ When farming people entered into social conflict around technological systems of mechanized agriculture, they did so not only as the consumers of manufactured machines, but also as producers of both agricultural products and of the industrializing farm itself.

Their conflicts took place in the market, and sometimes at the ballot box, but this dissertation, particularly in chapters 3 and 5, concerns itself with their efforts to assert their collective weight in the market because it was through organizations of cooperative purchasing that Midwestern farmers most directly challenged the power of manufacturers.³⁹ By the final quarter of the century, farming people were fully engaged

³⁶ John F. Kasson, *Civilizing the Machine: Technology and Republican Values in America, 1776-1900* (New York: Hill and Wang, 1976); Leo Marx, *The Machine in the Garden: Technology and the Pastoral Ideal in America* (London: Oxford University Press, 2000) [Originally Published 1964]; Nye, David E. *American Technological Sublime*. Cambridge, MA: MIT Press, 1996; Stephen P. Rice, *Minding the Machine: Languages of Class in Early Industrial America* (Berkeley: University of California Press, 2004).

³⁷ Kim Voss, *The Making of American Exceptionalism: Knights of Labor and Class Formation in the Nineteenth Century* (Ithaca: Cornell University Press, 1993); Sean Wilentz, *Chants Democratic: New York City and the Rise of the American Working Class, 1788-1850* (New York: Oxford University Press, 1984).

³⁸ Lawrence Goodwyn, *Democratic Promise: The Populist Movement in America* (New York: Oxford University Press, 1976). Atak and Bateman, 12; Ott, "Producing a Past: McCormick Harvester and Producer Populists in the 1890s."

³⁹ On cooperative purchasing, see Solon J. Buck, *The Granger Movement: A Study of Agricultural Organization and Its Political, Economic and Social Manifestations, 1870-1880* (Cambridge, MA: Harvard University Press, 1913); D. Sven Nordin, *Rich Harvest: A History of the Grange, 1867-1900* (Jackson, MI: University of Mississippi Press, 1974); Thomas A. Woods, *Knights of the Plow: Oliver H Kelley and the Origins of the Grange in Republican Ideology* (West Lafayette: Purdue University Press, 1991); Jenny Bourne, *In Essentials Unity: An Economic History of the Grange* (Athens, OH: Ohio University Press, 2017); Arthur Hirsch, "Efforts of the Grange in the Middle West to Control the Price of Farm Machinery,

in the production of wheat at a scale that required machines, and they saw that manufacturers were best equipped to supply those necessary machines. They thus organized amongst themselves not to eliminate manufacturers, but to compel manufacturers to supply machines on more favorable terms. Their inability to sustain that effort for long ultimately set the stage for manufacturers to consolidate control of machine sale, distribution, and maintenance.

There were also conflicts within farming communities around the labor involved in mechanized farming. Proprietors contended with hired hands about the extents of mechanization, and the men and women of farm families contended over what mechanization would mean for family labor.

Farmers and their hired workers sometimes clashed over the use of machines. Such conflicts remained relatively muted by the aspirations of many farm workers to become proprietors themselves, as well as by the connections between rural men on different rungs of the “agricultural ladder.” Most farm workers aspired to become landed

1870-1880,” *Mississippi Valley Historical Review* 19, no. 4 (March 1929): 473–96; George Cerny, “Cooperation in the Midwest in the Granger Era, 1869-1875,” *Agricultural History* 37, no. 4 (October 1963): 187-193+195-205; Douglass R. Hurt, “The Ohio Grange, 1870-1900,” *Northwest Ohio Quarterly* 53 (1981): 19–32; Roy V. Scott, “Grangerism in Champaign County, Illinois, 1873-1877,” *Mid-America* 43, no. 3 (July 1961): 139–63. For the movement in the South, see, Theodore Saloutos, “The Grange in the South, 1870-1877,” *Journal of Southern History* 19, no. 4 (1953): 473–87. For farmer efforts in electoral politics, see Goodwyn, *Democratic Promise*; George H. Miller, *Railroads and the Granger Laws* (Madison, WI: University of Wisconsin Press, 1971); Richard Hofstadter, *The Age of Reform: From Bryan to F.D.R.* (New York: Alfred A. Knopf, 1956); John D. Hicks, *Populist Revolt: A History of the Farmers’ Alliance and the People’s Party* (Lincoln: University of Nebraska Press, 1959); Norman Pollack, *The Populist Response to Industrial America* (Cambridge: Harvard University Press, 1962); Jeffrey Ostler, *Prairie Populism: The Fate of Agrarian Radicalism in Kansas, Nebraska, and Iowa, 1880-1892* (Lawrence: University of Kansas Press, 1993); Charles Postel, *The Populist Vision* (Oxford: Oxford University Press, 2007); Adam Slez, *The Making of the Populist Movement: State, Market, and Party on the Western Frontier* (Oxford: Oxford University Press, 2020).

proprietors themselves.⁴⁰ The agricultural ladder also moved both directions, as small farmers could lose their land and find themselves in the position of hired laborers as easily as hired laborers could climb the ladder. Certain populations of farm workers, including migratory harvesters in the prairie states and black farm workers in the Ohio River Valley, faced a steeper climb towards proprietorship, but nonetheless participated in the negotiation and conflict surrounding the development of industrial agriculture.

The men and women of farm families also sometimes differed over how to pursue the industrialization of the farm. Yet scholars of women and gender in the rural Midwest and Ontario in this period, as well as scholars of farm mechanization, have tended to tell the story of the mechanization of the farm household separately from that of the mechanization of the fields. Some rural household labor roles were gendered, but the division was permeable, and with the introduction of new machines in both the home and field, it is important to consider the use of sewing machines alongside the use of mechanical reapers.⁴¹ While male-headed farm families tended to prioritize field

⁴⁰ David E. Schob, *Hired Hands and Plowboys: Farm Labor in the Midwest, 1815-1860* (Urbana: University of Illinois Press, 1975); Rebecca Shepherd Cunningham, "Men on the Move: The Economic and Geographic Mobility of Farm Laborers in the Old Midwest, 1850-1870" PhD. Dissertation, (Bloomington, Indiana University, 1976).

⁴¹ Neth, *Preserving the Farm Family*, 1995; Glenda Riley, *Frontierswomen: The Iowa Experience* (Ames: Iowa State University Press, 1981); Deborah Fink, *Agrarian Women: Wives and Mothers in Rural Nebraska, 1880-1940* (Chapel Hill: University of North Carolina Press, 1992); Dorothy Schwieder, "Labor and Economic Roles of Iowa Farm Wives, 1840-1880," in *Farmers, Bureaucrats, and Middlemen: Historical Perspectives on American Agriculture*, ed. Trudy Huskamp Peterson (Washington: Howard University Press, 1980), 152-74; Glenda Riley, "'Not Gainfully Employed': Women on the Iowa Frontier, 1833-1870," *Pacific Historical Review* 49 (May 1980): 237-64; Sheryll Patterson-Black, "Women Homesteaders on the Great Plains Frontier," *Frontiers* 1, no. 2 (Spring 1976): 67-88. Deborah Fink, "Mom, It's a Losing Proposition," *North Dakota Quarterly* 52 (Winter 1984): 26-33; John Mack Faragher, "History from the Inside-Out: Writing the History of Women in Rural America," *American Quarterly* 33, no. 5 (Winter 1981): 537-57. For similar discussions of farm women in Canada, see, Linda Rasmussen et al., eds., *A Harvest Yet to Reap: A History of Prairie Women* (Toronto: Women's Press, 1976). For other

machines over household machines, farm women occasionally contested that preference with their own claims as producers of the mechanized household. These conflicts serve as a prologue to the struggles that Katherine Jellison identifies, in which farm women asserted their rights to electrical power in the twentieth century.⁴² On the other hand, farm women sometimes shared their husbands' prioritization of field machines or were instead skeptical of mechanization in general. Some farm women may also have been less enthusiastic about mechanization in general due to their own experiences in seeing mechanization lead not to the alleviation of labor, but simply to more labor of different kinds, as Ruth Schwartz Cowan argues in *More Work For Mother*.⁴³ As farming people made kin, community, and hired workers into components of technological systems, they encountered conflicts within their social systems of labor organization.

Nevertheless, of all these conflicts, those between machine manufacturers and farming people had the highest stakes and the most decisive resolution. This victory was won by machine manufacturers and their agents, who emerged as the commanders of

regions of the United States, see also, Catherine Kelley, *In the New England Fashion: Reshaping Women's Lives in the Nineteenth Century* (Ithaca: Cornell University Press, 1999); Jeanne Boydston, *Home and Work*; Joan M. Jensen, *Loosening the Bonds: Mid-Atlantic Farm Women, 1750-1850* (New Haven: Yale University Press, 1988); Nancy Grey Osterud, *Bonds of Community: The Lives of Farm Women in Nineteenth-Century New York* (Ithaca: Cornell University Press, 2018) [Originally Published 1991]; Judith Giesberg, *Army at Home: Women and the Civil War on the Northern Home Front* (Chapel Hill: University of North Carolina Press, 2009).

⁴² Katherine Jellison, *Entitled to Power: Farm Women and Technology, 1913-1963* (Chapel Hill: University of North Carolina Press, 1993).

⁴³ Ruth Schwartz Cowan, *More Work For Mother: The Ironies of Household Technology From the Open Hearth To the Microwave* (New York: Basic Books, 1983); Connolly, 112-117, also argues that the adoption of sewing machines, specifically, in the nineteenth-century did little to reduce labor time spent sewing. For another perspective on the industrialization of the household—a process that extended well into the twentieth century—see, Susan Strasser, *Never Done: A History of American Housework* (New York: Pantheon Books, 1982).

industrial agriculture by the end of the century. This development runs parallel to, and likely could not have occurred without, the developments within machine production described by Gordon Winder, in which manufacturers like McCormick broke with craft worker control of production by the mid-1880s.⁴⁴ Farmers, who remained dependent on increasingly expensive and complicated machines to sustain the technological systems of their farms, were left with little ability to command the production and maintenance of those technological systems themselves by the end of the century.

The Production and Maintenance of Technological Systems

Machines on the Farm argues that farming people produced the technological systems that constituted industrial grain agriculture. It is thus concerned with concepts of technological systems as well as the extent to which the everyday users of machines and other technologies shape their own sociotechnical worlds. Technological systems include machines and tools as components, but they are also comprised of human labor, knowledge, and social relations. All of these form components of systems through which human actors accomplish tasks. These systems are what made the development of industrial capitalism in the rural Midwest and Ontario possible and also constituted the terrain over which farming people and machine manufacturers contested.

⁴⁴ Winder, 19, *passim*.

Historians of technology have long used the concept of technological systems as an analytical tool. Thomas Parke Hughes introduced and defined the concept of technological systems as efforts to solve problems and accomplish desired ends through the application of multiple “related parts, or components,” that are connected to one another through a “network, or structure.”⁴⁵ Hughes considered the use of the term “system” apt when discussing technologies that were constituted by layers of distinct artifacts and users but implemented and directed towards unified goals. Focusing on the large-scale systems of the twentieth century, such as electrical power grids and heavy manufacturing, Hughes also considered systems to be defined by the centralization of control.⁴⁶ Nineteenth-century wheat farmers built much smaller-scale technological systems on their farms out of components that included machines, farm families, hired workers, fields, and animals. These systems came from more diffuse sources, and the control of them was not so easily centralized. Nevertheless, each farm itself constituted a technological system in which distinct components were marshalled towards specific goals of crop production and the production of the household, even as control itself was contested.

⁴⁵ Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore: Johns Hopkins University Press, 1983), 5.

⁴⁶ Thomas P. Hughes, *Networks of Power*; Thomas P. Hughes, *American Genesis: A Century of Invention and Technological Enthusiasm* (Chicago: University of Chicago Press, 1989); Thomas P. Hughes, *Human-Built World* (Chicago: University of Chicago Press, 2004); Thomas P. Hughes, *Elmer Sperry: Inventor and Engineer* (Baltimore: Johns Hopkins University Press, 1993); Merritt Roe Smith and Leo Marx, eds., *Does Technology Drive History?: The Dilemma of Technological Determinism* (Cambridge: MIT Press, 1994); Thomas P. Hughes, “The Evolution of Large Technological Systems,” in *The Social Construction of Technological Systems*, ed. Wiebe E. Bijker, Thomas P. Hughes, and Trevor J. Pinch (Cambridge: MIT Press, 1987), 45–76; David E. Nye, *Consuming Power: A Social History of American Energies* (Cambridge: MIT Press, 1999).

Technological systems are not made purely out of mechanical or electrical components—they contain also human users, animal power, and environmental landscapes alongside reapers, threshers, and sewing machines. They are thus built in the context of human social relations, cultures, and intentions. Because people and their beliefs and practices are heavily involved in technological systems, the “socially constructed” nature of technological systems has been a theme of the historiography of technology as some scholars argue against technological determinism. These scholars have argued that technological systems, including complex tools and objects as well as their human use, are shaped largely by the social conditions under which those technologies were brought into existence.⁴⁷ The social constructivist perspective on technology, however, can fall into its own forms of determinism. Historians of technology thus continue to seek perspectives that balance the ways in which society and technology shape one another in history, and to find the ways that social, cultural, and political developments, alongside technological ones, “embody humanity’s choice of its future.”⁴⁸ The “threshold debates” among economic historians of farm mechanization offer an example of how other scholars have demonstrated that the use of farm machines was conditioned by social considerations alongside the technical.⁴⁹ *Machines on the*

⁴⁷ Donald MacKenzie and Judy Wajcman, eds., *The Social Shaping of Technology* (Philadelphia: Open University Press, 1985); Bijker, Hughes, and Pinch, *The Social Construction of Technological Systems*; Smith and Marx, eds., *Does Technology Drive History?*

⁴⁸ Smith and Marx. “Introduction.” In *Does Technology Drive History?*, xiv; See also, Thomas P. Hughes, “Technological Momentum,” in Smith and Marx eds., *Does Technology Drive History?*, 101–13; Langdon Winner, “Opening the Black Box and Finding It Empty,” *Technology and Culture* 18, no. 3 (Summer 1993): 362–78, provides a useful critique of the social constructivist position.

⁴⁹ Research and discussion of the multifaceted nature of machine adoption in grain farming was an area of sustained inquiry among economic historians in the second half of the twentieth century. See, James

Farm further interrogates how farming people built systems that included both machines and the social relationships between people in farming families and communities.

In its analysis of the production of technological systems, this dissertation pays particular attention also to the non-human and non-mechanical parts of technological systems. Technological systems are also constituted by non-human organisms, as humans alter, and adapt to, landscapes, plants, and animals. Agricultural historians have long taken soil, crops, and animals into their accounts, even if they did not consider them explicitly as technology.⁵⁰ Environmental and animal historians center those non-human components in urban as well as rural spaces.⁵¹ Historians of technology have

Baughman, "New Directions in American Economic and Business History," In *American History: Retrospect and Prospect*, ed. George Billias and Gerald Grob (New York: Free Press, 1971), 286; David, "The Mechanization of Reaping in the Ante-Bellum Midwest"; Alan L. Olmstead. "The Mechanization of Reaping and Mowing in American Agriculture, 1833-1870." *Journal of Economic History* 35, no. 2 (1975): 327–52; Robert E. Ankli. "The Coming of the Reaper." *Business and Economic History* 5 (1976): 1–24; Alan L. Olmstead and Paul W. Rhode. "Beyond the Threshold: An Analysis of the Characteristics and Behavior of Early Reaper Adopters." *Journal of Economic History* 55, no. 1 (March 1995).

⁵⁰ Donald Worster, "Transformations of the Earth: Toward an Agroecological Perspective in History," *Journal of American History* 76, no. 4 (March 1990): 1087–1106, calls attention to the connections between agricultural history and the field of environmental history as it was then developing. Sterling Evans, "The 'Age of Agricultural Ignorance': Trends and Concerns for Agriculture Knee-Deep into the Twenty-First Century," *Agricultural History* 93, no. 1 (Winter 2019): 4–34, discusses the continuing relationship between the fields of environmental and agricultural history in the decades since. For examples of classic agricultural histories of the region in which environmental considerations are central, see, Gates, *The Farmer's Age*; Fite, *The Farmer's Frontier*; Shannon, *The Farmer's Last Frontier*; Atack and Bateman, *To Their Own Soil*; Steven Stoll, *Larding the Lean Earth: Soil and Society in Nineteenth-Century America* (New York: Hill and Wang, 2002). For an example of agricultural historians' consideration of draft animals in history, see, Bidwell and Falconer, 443-447.

⁵¹ Evans, *Bound in Twine*, provides a scholarly study of an aspect of the grain farm machine industry from a later time period that places technological systems in environmental context. William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: Norton, 1991), provides an excellent example of environmental history that concerns the economic and ecological relationship between rural and urban. For animal histories of draft animals in the nineteenth-century U.S. and Canada, see, Clay McShane and Joel Tarr, *The Horse in the City: Living Machines in the Nineteenth Century* (Baltimore: Johns Hopkins University Press, 2007); Margaret E. Derry, *Horses in Society: The Story of Animal Breeding and Marketing, 1800-1920* (Toronto: University of Toronto Press, 2006); Ann Norton Greene, *Horses at Work: Harnessing Power in Industrial America* (Cambridge: Harvard University Press, 2008). For considerations of animal history more broadly, see, Edmund Russell, "Coevolutionary History," *American Historical*

incorporated these concerns into their studies of human-built technological systems.⁵²

Following these insights, *Machines on the Farm* demonstrates that farming people were able to build technological systems based on their familiarity not only with machines, but also with animals, crops, and terrain.

This dissertation explores the contributions of farming people to the construction of the world-altering technological systems of industrial capitalism. Histories of the human construction of technological systems often see this construction as driven by institutions and centers of power. The historiography of technology has often focused on centers power including governments, corporations, or systems-building inventors, though some scholars of technology endeavor to place ordinary people at the center of its history.⁵³ Historians must continue to explore the conflicts through which ordinary people shape technological change in conversation with powerful institutions.

Review 119, no. 5 (December 2014): 1514–28; Joshua Specht, “Animal History after Its Triumph: Unexpected Animals, Evolutionary Approaches, and Animal Lens,” *History Compass* 14, no. 7 (July 2016): 326–36.

⁵² Jeffrey K. Stine and Joel Tarr, “The Intersection of Histories: Technology and the Environment,” *Technology and Culture* 39, no. 4 (October 1998): 601–40; Edmund Russell et al., “The Nature of Power: Synthesizing the History of Technology and Environmental History,” *Technology and Culture* 52, no. 2 (April 2011): 246–59.

⁵³ Carolyn C. Cooper, “Social Construction of Invention through Patent Management: Thomas Blanchard’s Woodworking Machinery,” *Technology and Culture* 32, no. 4 (October 1991): 960–98; David F. Noble, *America by Design: Science, Technology, and the Rise of Corporate Capitalism* (New York: Oxford University Press, 1977); David F. Noble, *Forces of Production: A Social History of Industrial Automation* (New York: Alfred A. Knopf, 1984). For only a few recent examples of histories of technology that place ordinary people in the nineteenth century at the center, see, Catherine McNeur, *Taming Manhattan: Environmental Battles in the Antebellum City* (Cambridge, MA: Harvard University Press, 2014); Karen Jones, Giacomo Macola, and David Welch, eds., *A Cultural History of Firearms in the Age of Empire* (Burlington, VT: Ashgate, 2013); Barbara Hahn, *Making Tobacco Bright: Creating an American Commodity* (Baltimore: Johns Hopkins University Press, 2011).

Since many ordinary people interacted with new technologies as consumers, scholars of technology have studied how consumers shaped the course of technological adoption. Ruth Schwartz Cowan's concept of the "Consumption Junction" demonstrates how the ability and willingness of consumers to adapt to new devices could be a prerequisite to the development of wider technological systems around them.⁵⁴ Other scholars have seen consumer agency in the ways in which consumers made use of, and came to possess socially important knowledge of, their newly adopted devices. Some of these scholars have even written about farm technologies in particular, including Carrie A. Meyer, whose work on the adoption of gas-powered engines for domestic work illustrates how farm women asserted technological agency.⁵⁵ Ronald Kline and Trevor Pinch have demonstrated the ways in which rural people shaped the automobile as the users of these machines.⁵⁶ As consumers and users purchased some devices and not others, and as they took command of some devices in the course of their daily labors, they exercised technological agency.

Some consumers not only purchased and used machines in ways unintended by manufacturers, but also physically altered machines into something new. The concept of

⁵⁴ Ruth Schwartz Cowan, "The Consumption Junction: A Proposal for Research in the Sociology of Technology," in *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, ed. Wiebe E. Bijker, Thomas P. Hughes, and Trevor J. Pinch (Cambridge, MA: MIT Press, 1987), 254–72.

⁵⁵ Carrie A. Meyer, "Farm Debut of the Gasoline Engine," *Agricultural History* 87, no. 3 (Summer 2013): 287–313; Carrie A. Meyer, "Farm Women and Gas Engines: The New Technology in the Barnyard," *Indiana Magazine of History* 114, no. 2 (June 2018): 115–44; See also, Susan J. Douglas, *Inventing American Broadcasting, 1899-1922* (Baltimore: Johns Hopkins University Press, 1987), 187-215.

⁵⁶ Ronald Kline and Trevor J. Pinch, "Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States," *Technology and Culture* 37, no. 4 (October 1996): 763–95; See also, Kline, *Consumers in the Country*.

“tinkering” has also allowed useful explorations of consumer and user alterations of machines and technological systems. Kathleen Franz has demonstrated this to be the case concerning automobiles in the first decades of the twentieth century. Consumers altered their cars and, in doing so, renegotiated their identities within, and relationships to, gender, public space, and technical expertise. The act of tinkering not only allowed consumers to build and re-build their own sociotechnical worlds through automobiles, however, but also allowed them to shape the automobile industry by entering into a dialectical process with manufacturers, among others.⁵⁷ Such technological alteration took place routinely in different contexts across diverse machines. Even the mass-produced consumer devices of the twentieth century were not simply accepted by consumers as they were imagined by manufacturers.⁵⁸ Instead, technological systems were constructed out of the relationships between different groups of people as well as between humans and machines. While this scholarship draws attention to the agency of users and consumers, it nonetheless also calls us to be cognizant of the limits of this

⁵⁷ Kathleen Franz, *Tinkering: Consumers Reinvent the Early Automobile* (Philadelphia: University of Pennsylvania Press, 2005).

⁵⁸ Yuzo Takahashi, “A Network of Tinkerers: The Advent of the Radio and Television Receiver in Japan,” *Technology and Culture* 41, no. 3 (July 2000): 460–84; Honghong Tinn, “From DIY Computers to Illegal Copies: The Controversy over Tinkering with Microcomputers in Taiwan, 1980-1984,” *IEEE Annals of the History of Computing* 33, no. 2 (February 2011): 75–88; Jaipreet Virdi, “Tinkering with Hearing Aids: Maintenance, Self-Repair, and Disability Agency,” Conference Presentation at the Society for the History of Technology Virtual Forum, October 9, 2020; Ruth Oldenziel and Mikael Hard, *Consumers, Tinkerers, Rebels: The People Who Shaped Europe* (Basingstoke: Palgrave Macmillan, 2013). For other social histories of technology that describe similar actions by different names, see, Joseph J. Corn, *User Unfriendly: Consumer Struggles with Personal Technologies, from Clocks and Sewing Machines to Cars and Computers* (Baltimore: Johns Hopkins University Press, 2011); Claude S. Fisher, *America Calling: A Social History of the Telephone* (Los Angeles: University of California Press, 1994).

agency, as consumers and users contend for control of the technology with powerful institutions.

Even when the everyday users of technologies did not seek to shape them into something new, but instead simply to maintain them, their labor nonetheless produced both the technologies themselves as well as technological systems they constituted. Recent scholars have displaced the primacy given to innovation within the history of technology by turning to the study of maintenance as a socially necessary action as well as a terrain of conflict. Andrew L. Russel and Lee Vinsel have made this call for maintenance studies most directly. In doing so, they channel the spirit of David Edgerton’s approach to the study of everyday and “old” technologies rather than only those which appear most novel in any given era.⁵⁹ By studying machine maintenance, and breaking the association between technology and novelty, we see that the production of technological systems need not happen exclusively among capitalists, inventors, or engineers, but indeed also among machine users like farmers. Maintenance scholars have been inspired by other scholarly efforts to put the voices and actions of ordinary people at the center of our narratives. These scholars have also challenged the primacy placed by historians of technology on innovation as marginalizing the vast majority of people who lived with machines.⁶⁰ This dissertation turns its attention to maintenance in a context in

⁵⁹ Andrew L. Russell and Lee Vinsel, “After Innovation, Turn to Maintenance,” *Technology and Culture* 59, no. 1 (January 2018): 1–25; David Edgerton, *The Shock of the Old: Technology and Global History Since 1900* (Oxford: Oxford University Press, 2007).

⁶⁰ David Edgerton, “Innovation, Technology, or History: What Is the Historiography of Technology About?” *Technology and Culture* 52, no. 3 (July 2010): 680–97; Nina E. Lerman, Arwen Palmer Mohun, and Ruth Oldenziel, “The Shoulders We Stand on and the View From Here: Historiography and Directions

which it has not been thoroughly examined and considers maintenance as a way in which farming people produced, and struggled for, technological systems of mechanized agriculture.

Machines on the Farm places maintenance and tinkering in a nineteenth-century context before the dawn of mass production and consumerism. Most scholarship on tinkering casts it in a distinctly consumerist context to illuminate how consumers of mass-produced products asserted their agency. This dissertation demonstrates how farming people also struggled for socio-technical agency. In doing so, I argue, they asserted their place as producers within developing industrial capitalism. Studies of maintenance in the nineteenth and twentieth century have mostly concerned the maintenance of large infrastructure projects rather than personal machines like sewing machines or mechanical reapers.⁶¹ Turning our attention to the machines, owned, worked,

for Research,” *Technology and Culture* 38, no. 1 (1997): 9–30; Carroll Pursell, *The Machine in Modern America* (Baltimore: Johns Hopkins University Press, 1995); Carroll Pursell, “Seeing the Invisible: New Perceptions in the History of Technology” 1 (1995): 9–15.

⁶¹ For studies of maintenance in the nineteenth-century, see, Ann Norton Greene, “Success as ‘Failure’: Historians, Engineers, and Maintaining the Erie Canal,” (paper presented at Maintainers I, Stevens Institute of Technology, Hoboken, NJ, April 8, 2016); John Laurence Busch, “Maintaining Innovators or Innovating Maintainers?: Revolutionaries vs. Reactionaries in the 19th Century Maritime World,” (paper presented at Maintainers I, Stevens Institute of Technology, Hoboken, NJ, April 8, 2016); Daniel Belteki, “Caring for the Circle: The Maintenance of Airy Transit Circle, 1851-1861” (paper presented at Maintainers II, Stevens Institute of Technology, Hoboken, NJ, April 7, 2017); Adelheid Voskuhl, “Maintaining the State: Civil Service, Engineering, and Class in Pre-Industrial and Industrial Ages, 1713-1914” (paper presented at Maintainers II, Stevens Institute of Technology, Hoboken, NJ, April 8, 2017); Amy Wickner, “Waste Remediation and Maintenance in the 19th Century Paris Sewer” (paper presented at Maintainers II, Stevens Institute of Technology, Hoboken, NJ, April 8, 2017); Hounshell, *From the American System to Mass Production*, 91-92, 158-160, gives some brief analysis of the ways in which sewing machine and reaper manufacturers were involved in machine repair. For twentieth-century infrastructure studies, see, S. D. N. Graham and N. Thrift, “Out of Order: Understanding Repair and Maintenance,” *Theory, Culture & Society* 24, no. 3 (2007): 1–25; Penelope Harvey, Casper Bruun Jensen, and Atsuro Morita, eds., *Infrastructures and Social Complexity: A Routledge Companion* (New York: Routledge, 2016); Bradley Fidler and Andrew L. Russell, “Financial and Administrative Infrastructure for the Early Internet: Network Maintenance at the Defense Information Systems Agency,” *Technology and Culture* 59, no. 4 (October

altered, and maintained by farming families, *Machines on the Farm* demonstrates how ordinary farmers produced and contested over the development of industrial capitalism in the nineteenth century.

The study of machine use, alteration, and maintenance in the nineteenth century requires consideration of the relationship between those activities of machine users and the acts of production and consumption. Scholars of twentieth-century maintenance, notably Kevin L. Borg, have considered maintenance as something in between production and consumption. Borg refers to this as a “middle ground,” in which he locates twentieth-century auto mechanics. Yet Borg also establishes an unnecessary boundary between the “middle ground” of maintenance and the consumer maintenance activities of, for instance, women who repaired household items.⁶² Nineteenth-century farming families, by contrast, practiced machine maintenance on both agricultural machines and domestic machines; both were integral to the technological systems of the farm. As Cowan has demonstrated in *More Work For Mother*, maintenance sometimes

2018): 899–924; Christopher R. Henke and Benjamin Sims, *Repairing Infrastructures: The Maintenance of Materiality and Power* (Cambridge: MIT Press, 2020); See also, Stefan Krebs and Heike Weber, eds., *The Persistence of Technology: Histories of Repair, Reuse and Disposal* (Bielefeld: Transcript Verlag, 2021); Pierre Claude Reynard, “Unreliable Mills: Maintenance Practices in Early Modern Papermaking,” *Technology and Culture* 40, no. 2 (April 1999): 237–62, Pierre Claude Reynard’s study of repair in early-modern papermaking is an early outlier both in terms of the time period of its subject matter and its own date of publication.

⁶² Kevin L. Borg, *Auto Mechanics: Technology and Expertise in Twentieth-Century America* (Baltimore: Johns Hopkins University Press, 2007), 179n4; In addition to Borg and Franz for histories of repair in the automotive industry, see also, Douglas Harper, *Working Knowledge: Skill and Community in a Small Shop* (Chicago: University of Chicago Press, 1987); David Lucsko, *Junkyards, Gearheads, and Rust: Salvaging the Automotive Past* (Baltimore: Johns Hopkins University Press, 2016); Stefan Krebs, “Maintaining the Mobility of Motorcars: The Case of (West) Germany, 1918-1980,” in Krebs and Weber, *The Persistence of Technology*, 139-162.

took the form of drudgery, but it was nearly always productive labor.⁶³ As farming people cultivated machine knowledge and maintained their machines, they entered into relationships with manufacturers and their agents as consumers but continued to act as producers within new technological systems.

This dissertation explores the process of the production of technological systems through the use, maintenance, and alteration of both machines and the systems into which they were introduced. It demonstrates how farming people made those systems as only they could in the context of farm life. In the process of that production, they made industrial capitalism in North American grain agriculture and participated in the social conflicts of producers under industrial capitalism.

Geography

This dissertation takes the Midwestern United States as its primary area of geographic focus because that was the region in which the American wheat belt of the nineteenth century developed. It was, consequently, also the region that first saw large-scale mechanization of grain agriculture. The Midwest includes the states of Ohio, Indiana, Michigan, Illinois, Wisconsin, Minnesota, Iowa, Nebraska, Kansas, and the Dakotas. Each chapter concerns all states and territories in the region, but the furthest

⁶³ Cowan, *More Work For Mother*; Jeanne Boydston, *Home and Work: Housework, Wages, and the Ideology of Labor in the Early Republic* (Oxford: Oxford University Press, 1990), provides a direct argument for collapsing the distinction between paid “productive” labor and unpaid housework, including, by implication, maintenance activities.

western states play a greater role in later decades—and thus also in later chapters—as both black and white farmers settled in western areas over the latter decades of the century.⁶⁴ While the western Great Lakes and Central Prairie regions developed differently from one another in some respects, their similarities in terms of the trajectory of the mechanization of grain farming across the Midwest as a region warrant joint consideration.

Machines were present in the farming activities of Native Americans as well. Some Native farmers cultivated wheat and used machines. Native American use of farm machines is thus an example of Native adoption and alteration of technologies similar to those discussed by Philip J. Deloria in *Indians in Unexpected Places*.⁶⁵ Yet the ways in which they acquired, used, and maintained machines were often conditioned by government programs through the Bureau of Indian Affairs and its local agents who were tasked with introducing machines as a part of assimilating Native people to “modern” forms of agriculture. Native grain farmers were certainly capable of mastering machines. Some government agents remarked positively on the abilities of local Native Americans in Midwestern states to use, maintain, and repair farm machinery.⁶⁶ Instruction in sewing

⁶⁴ While the majority of Midwestern wheat farmers were white, black Americans also moved into the Midwest over the nineteenth century and raised wheat just as their white neighbors did. See, for instance, Anna-Lisa Cox, *The Bone and Sinew of the Land: America's Forgotten Black Pioneers and the Struggle for Equality* (New York: Public Affairs, 2018); Stephen A. Vincent, *Southern Seed, Northern Soil: African-American Farm Communities in the Midwest, 1765-1900* (Bloomington: Indiana University Press, 1999).

⁶⁵ Philip J. Deloria, *Indians in Unexpected Places* (Lawrence: University Press of Kansas, 2004), 136-182.

⁶⁶ *Annual Report of the Commissioner of Indian Affairs* (Washington: G.P.O., 1874), 249; *Annual Report of the Commissioner of Indian Affairs* (Washington: G.P.O., 1877), 58; *Annual Report of the Commissioner of Indian Affairs* (Washington: G.P.O., 1888), 172; Some agents of the Bureau of Indian Affairs, on the other hand, expressed less favorable views of Native peoples' practices of machine use and maintenance. See,

machine use was also often a part of the curricula of schools for Native girls both on and off reservations.⁶⁷ Nevertheless, the role of the state, as well as the social and cultural practices of different Native American peoples, take this subject beyond the scope of this dissertation. Further research is required to make claims about how Native American farmers may have also produced systems of mechanized farming in the context of their relationships not only with machine manufacturers, but also with the United States government, and how they may have both adapted to the use of machines, and adapted machines to their own practices.⁶⁸

This dissertation also discusses farming people in the Canadian province of Ontario, though Ontario only borders, and is not in, the American Midwest. Ontario was similar to the Midwest as an agricultural region. Ontario farmers participated in the same production of technological systems of mechanized agriculture alongside their neighbors to the south in Minnesota, Wisconsin, and Michigan as they used and maintained machines. In discussing Ontario alongside the American Midwest, this dissertation hopes to compliment scholarship on the farm and sewing machine industries that have already taken an international focus.⁶⁹ Yet in seeing the production of these technological

Annual Report of the Commissioner of Indian Affairs (Washington: G.P.O., 1885), 93; *Annual Report of the Commissioner of Indian Affairs* (Washington: G.P.O., 1891), 270.

⁶⁷ *Annual Report of the Commissioner of Indian Affairs* (Washington: G.P.O., 1875), 316; *Annual Report of the Commissioner of Indian Affairs* (Washington: G.P.O., 1876), 31; *Annual Report of the Commissioner of Indian Affairs* (Washington: G.P.O., 1880), 180; *Annual Report of the Commissioner of Indian Affairs* (Washington: G.P.O., 1882), 180.

⁶⁸ Delos Sacket Otis, *The Dawes Act and the Allotment of Indian Land*, ed. Francis Paul Prucha (Norman: University of Oklahoma Press, 1973), 55; Leonard A. Carlson, *Indians, Bureaucrats, and Land: The Dawes Act and the Decline of Indian Farming* (Westport, Connecticut: Greenwood Press, 1981), 87, 118.

⁶⁹ Winder, *American Reaper*; Evans, *Bound in Twine*; Robert Bruce Davies, *Peacefully Working to Conquer the World: Singer Sewing Machines in Foreign Markets* (New York City: Arno Press, 1976);

systems as something that particularly defined the Midwest in comparison to other regions in the United States, this dissertation also joins scholarship that has sought to revive historical interest in a region of the United States from which historians might learn much about capitalism and technology.⁷⁰

Sources

The sources of *Machines on the Farm* allow it to see the production of systems of mechanized agriculture from the perspective of farming people as well as from the perspective of machine manufacturers and their agents. Approaching these technological systems from both of these sides elucidates the processes of construction and conflict at play throughout the second half of the nineteenth century.

Sources pertaining to rural life and people compose a large portion of those consulted for this dissertation. Agricultural newspapers show the public discourse of broader farming communities, even as farm press editors shaped that discourse alongside farmers themselves. Among the agricultural papers this dissertation turns to is the *Prairie Farmer*. Published in Chicago throughout this period, it was one of the most influential

Godfrey, *An International History of the Sewing Machine*; Andrew Godley, *Selling the Sewing Machine Around the World: Singer's International Marketing Strategies, 1850-1920* (Cambridge: University of Cambridge Press, 2006).

⁷⁰ Kristin L. Hoganson, *The Heartland: An American History* (New York: Penguin, 2019); Andrew R. F. Cayton and Peter Onuf, *The Midwest and the Nation: Rethinking the History of an American Region* (Bloomington: Indiana University Press, 1990); James R. Shortridge, *The Middle West: Its Meaning in American Culture* (Lawrence: University of Kansas Press, 1989).

agricultural papers of the era with a circulation that grew from 5,000 in 1852 to 30,000 in 1870.⁷¹ The *Prairie Farmer* thereafter remained an influential farm paper through the end of the century even as it saw competition from other Chicago-based papers like the *Western Rural*. The papers, diaries, letters, and recollections of farming people, on the other hand, provide a perspective on the construction of technological systems from on the farm itself. Many of these are held in either manuscript or microfilm form at state historical societies throughout the Midwest as well as at other archival research libraries. Some are available as published monographs. Many recollections written and published in the early twentieth century about farm life in the nineteenth century also provide more detailed, and sometimes richer, accounts, even as these rely on authors' memories. Analyzing and comparing these sources allows this dissertation to tell the story of the mechanization of agriculture from the perspective of farming people.

Other sources pertain more directly to machine manufacturers. The reporting of the farm press on the activities of manufacturers provides some of this perspective. This dissertation also cites the McCormick-International Harvester Collection held by the Wisconsin Historical Society as it is the largest and one of the only collections of archival materials related to this industry. The internal correspondence of McCormick company agents as well as the company's trade literature and advertising offers a view of technological systems from the manufacturers' perspective. The trade literature of other

⁷¹ Joseph Camp Griffith Kennedy, *Catalogue of the Newspapers and Periodicals Published in the United States* (New York: J. Livingston, 1852), 8; *The Men Who Advertise; An Account of Successful Advertisers* (New York: Nelson Chesman, 1870), 633.

manufacturers, including those who manufactured sewing and washing machines, was also consulted both in archival settings and in digitized formats. Combined with those of farming people, these sources provide information on the daily activities and conflicts involved in the production of mechanized agriculture.

Chronology and Chapters

Our story covers the second half of the nineteenth century. It begins in 1845 because the second half of the 1840s saw the first manufacturing of mechanical reapers at a significant scale in the United States by McCormick in Cincinnati, Ohio.⁷² While manufacturers in the Mid-Atlantic established themselves thereafter and produced for an eastern market, they nonetheless also produced significantly for the near-Midwestern states of Ohio, Michigan, and Indiana, while manufacturers throughout the Midwest—including Chicago, where both McCormick and its largest competitor, the Deering Harvester Company, were located—sold throughout the region, especially in its western half.⁷³ The manufacture and use of the other types of machines followed in the 1850s and spread throughout the remaining decades of the century.⁷⁴ The dawn of the farm machine industry also coincided with the rise to prominence of Midwestern wheat. By the end of the nineteenth century, Midwestern agriculture had begun to gain greater commercial

⁷² Ardrey, 40-48, 72-74.

⁷³ Winder, 57-61.

⁷⁴ Ardrey; Rogin.

crop diversity and to lose its place atop world wheat markets. International competition in the sale of wheat and a growing attention to corn and livestock left the Midwest a very different agricultural region by the end of the century, where our story closes.⁷⁵

Part One of the dissertation considers the adoption of machines in the middle decades of the century, highlighting practices of use and maintenance as farmers produced technological systems. This first period covers the years from the first significant manufacturer of mechanical reapers for a Midwestern market in the mid-1840s to the changed conditions of the mid-1870s that are covered in the second part. Part Two considers the final quarter of the century. It also follows a trajectory within the technological systems of mechanized agriculture themselves wherein the machines of later decades—notably including self-binding harvesters—were manufactured larger and more complicated. Machine companies also took steps to assert themselves and their agents as the proper authorities within technological systems of mechanized agriculture. These developments restricted the abilities of farming people to claim control over new machines through use, maintenance, and tinkering. At the same time, farmers had become more dependent on the large-scale production of wheat to sustain their operations and were less able to do without machinery. Farming people thus lost some control of technological systems to manufacturers while simultaneously becoming more dependent on those systems

⁷⁵ Bogue, *From Prairie Belt to Corn Belt*.

Within Part One, Chapter One explores the ways in which farming people adopted machines in the middle decades of the nineteenth century and produced new technological systems out of the relationships between their machines and their farm systems of labor organization, crop cultivation, and animal husbandry. Chapter Two takes on the issue of maintenance. It demonstrates how farmers produced technological systems by the socially necessary act of maintenance and repair in conditions of economic precarity. In these decades, farming people were still able to control many aspects of maintenance and repair processes independent of manufacturers.

The mid-1870s saw three developments that re-shaped how farming people interacted with machines and contended with manufacturers—the Panic of 1873, the zenith of the Granger movement in 1875, and the introduction of self-binding harvesters throughout the second half of the decade. The Panic inaugurated national economic conditions which augmented the precarity of Midwestern wheat farming and also heightened the struggle between manufacturers and farmers for the profits of agriculture. Chapter Three thus turns its attention to the second development: the Granger movement of the 1870s. This chapter explores how farmers claimed ownership of mechanized agriculture through the efforts of the Patrons of Husbandry to cooperatively purchase farm machines. The ultimate failure of the Granger movement to gain control, or at least greater influence, in the farm machine industry left machine manufacturers in a position to assert their own control of machine purchase and maintenance in coming decades. Chapter Four sees another example of farmers claiming ownership of their technological

world, but in this instance through tinkering, alteration, and innovation in the 1880s as they solicited the McCormick Harvester Machine Company with claimed inventions of new machines and machine components. Yet their efforts were limited by the third development of the mid-1870s that reshaped sociotechnical relationships: the introduction of self-binding harvesters. Farmers were less able to assert knowledge and agency of new technical systems associated with automatic binding than they were with older systems and with those systems that were rooted in the relationships between machines and the farm systems discussed in Chapter One. Chapter Five also addresses the changed sociotechnical world of the later decades of the century as machines were more abundant and more complicated. It demonstrates how this context, as well as the strategies of manufacturing companies, weakened farmers' ability to claim ownership of systems of mechanized agriculture.

By the end of the century, the mechanization of grain agriculture in the American Midwest had reached as far as it would while still reliant on animal and human motive power. New machines such as gas-powered tractors and combines would populate the farms of the twentieth century. Yet by that time farming people had already produced and struggled over complex technological systems of mechanized grain farming that intersected with many aspects of the farmers' rural world. Farming people like Hugh Orchard and his family made these systems out of components that only they could muster and contended for those systems in precarious and unequal economic conditions. As participants in capitalism, they wrung unprecedented amounts of value out of the

social, technical, environmental, and animal worlds that surrounded them. As farmers and mechanics, they built and contended for their part of the modern world.

PART ONE

Chapter One

Technological Systems and Farm Systems: Farming People Bring Machines to their Fields and Homes, 1845-1875

Grain farming in the Midwest and Ontario was a domain of hand tools and human power in the first half of the nineteenth century. Farming families and hired workers scattered winter wheat seed by hand in the fall to be harvested the next summer. They did the same in spring with seed for spring wheat to harvest in the fall. Harvesters used sickles, scythes, and cradles to cut the grains while others followed behind them to bind the crop left in their wake. Sometimes farming people would stack the bundles and leave them to dry before moving them to a flat and clear area, often inside a barn, for threshing. Threshing separated the grain itself from the stalk and chaff. The two most common methods of threshing in the first half of the century were by animal treading or by the flail—an implement which threshers used to beat the crop upon the ground. They next separated the loose grain from the stalk and chaff by winnowing, in which they exposed the grain to wind or tossed it into the air. The farm family would then have usable, or marketable, grain.⁷⁶

⁷⁶ Rogin, 69-72, 176-180, 206; Graeme Quick and Wesley Fischer Buchele, *The Grain Harvesters* (St. Joseph, MI: American Society of Agricultural Engineers, 1978), 1-16, 39-62.



Figure 1: At left is an illustration of farmer using a scythe to cut grasses and at right is an illustration of a farmer using a cradle to cut grains. Benjamin Butterworth, *The Growth of Industrial Art* (Washington: G.P.O., 1892), p. 14-15. <https://archive.org/details/growthindustria00Unit>.

Human labor and hand tools drove other important farm labors. Women mended and fashioned clothes by hand sewing. They also washed them with the aid of a washboard, bucket, and drying line. These tasks were year-round and constant. Farm women typically reserved at least one day a week—often Monday—for washing. Processes for washing could vary, but they often lasted the entire day and involved copious scrubbing and lots of heated water.⁷⁷ Sewing and repairing clothing were likewise year-round activities, involving distinct time-consuming projects. Making new articles of clothing was more seasonal, as women would prepare new outfits for family members to correspond with the changing of the seasons. By the 1850s, most women did not spin or weave their own cloth, but they did sew manufactured linen or cotton-based fabrics like calico into wearable clothing. While sewing projects were a significant

⁷⁷ Strasser, *Never Done*, 105-106.

household responsibility, their less time-sensitive nature than other housework often meant that women did them in between other household tasks.⁷⁸

These field and household labor processes changed drastically during the middle decades of the century. By purchasing and using new machines, farming families took advantage of the products of industry through the circulation channels of financial and commercial capitalism. In pursuit of landed proprietorship and of profit, farm families used new machines to maximize the efforts of their labors. Yet machines could only work when farmers made them work with the labor, crops, fields, and animals that constituted the extant systems of grain farming. This effort involved conflict, both within farming families and communities as well as between the agricultural population and the most dedicated promoters of machines, as farmers mechanized their operations only as far as it made sense to do so in the context of their own farm systems. They made new technological systems by adding machines to their systems of labor organization, crop cultivation, and animal husbandry. Through these efforts and conflicts, the technological systems of industrial agriculture took form in the middle decades of the century.

It is useful to think of the interactions of humans, machines, and animals on the farm as the interactions of different components of technological systems. Thomas Parke Hughes defined technological systems as being composed of “related parts, or

⁷⁸ Connolly, 51-55; Riley, *Frontierswomen: The Iowa Experience*, 67-73; Osterud, 188-193; Jensen, *With These Hands: Women Working on the Land*, 34. For discussion of sewing as a gendered labor practice in a later time period, see, Sarah A. Gordon, *“Make It Yourself”: Home Sewing, Gender, and Culture, 1890-1930* (New York: Columbia University Press, 2009); On sewing as conducted in the moment in between other household tasks, see, “Economy in Sewing.” *Peterson’s*, October 1858, 294-295. Hathi Trust Digital Archive. <https://catalog.hathitrust.org/Record/006062071>.

components,” including machines alongside human labor and knowledge.⁷⁹ Hughes applied the concept to large and centrally-controlled systems and was thus perhaps more interested in detailing the structure or network that connected the components of a system than in the components themselves. Yet, nineteenth-century grain farming was not a single system, but a myriad overlapping systems that people built and operated on each farm, often intersecting with the systems of other farms. When studying such systems, it is useful to begin with the types of components involved and how their interactions with other types of components were orchestrated. These include farm systems of labor organization, crop cultivation, and animal husbandry alongside machines themselves.

The question of order and control is also more ambiguous, and thus also contested, in the case of farm technology. Hughes considered the control of technological systems to be an essential part of their definition, as well as a determining factor of their limitations. In the case of technological systems on farms, it was farmers who attempted to build order and to control the systems of their own individual farms. But control was always contested, both within farm families and communities, as well as between farmers and machine manufacturers who saw farmers as a part of their own systems of machine production and sale. Farmers themselves were tools within the profit-generating systems of agricultural industry. The small-scale but pervasive technological systems of individual farms thus provide an opportunity for scholars to interrogate the contestation of technological systems.⁸⁰

⁷⁹ Hughes, *Networks of Power*, 5.

⁸⁰ Hughes, *Networks of Power*, 1-17.

While the human components of farm technological systems asserted agency in struggles for control, non-human components conditioned the possibilities of systems as well. Hughes defines the “environment” in which a technological system operates as those factors which shape a system that are beyond its center of control.⁸¹ However, the case of agricultural technology complicates this conception of the environment. Animals, crops, and lands occupied a liminal space in which they were subject to the control of the farmer and his system, but also set limitations on the farmers’ abilities and priorities. It is useful to take insight from scholars of animal history, environmental history, and especially those historians of technology who have brought these fields together with the history of technology.⁸² We can thus see these living components of technological systems as shaping and shaped by the efforts of farming people to industrialize.

In pursuing industrialization, farming people were inspired by ideas of technological development and the imagination of a materially progressive future. Historians have long documented the place of machines as ideological symbols of progress and utopian possibility in this context.⁸³ Emily Pawley has also demonstrated the importance of scientific thought and the imagination of agricultural futures to sustained enthusiasm for agricultural improvement among not only farmers, but other

⁸¹ Hughes, *Networks of Power*, 6.

⁸² Worster, “Transformations of the Earth”; Evans, “The ‘Age of Agricultural Ignorance.’”; McShane and Tarr, *The Horse in the City*; Derry, *Horses in Society*; Greene, *Horses at Work*; Russell, “Coevolutionary History”; Specht, “Animal History after Its Triumph”; Stine and Tarr, “The Intersection of Histories”; Russel et al., “The Nature of Power.”

⁸³ In particular, see, Segal, *Technological Utopianism in American Culture*; Kasson, *Civilizing the Machine*.

“improvers” as well.⁸⁴ This chapter demonstrates that farming people participated with enthusiasm in the imagination of fields and homes filled with new machines in the second half of the nineteenth century as well. In imagining such things however, they also made claims to the status of rightful participants in the mechanical future.

As farming people made use of machines, they did so to suit the needs of their farm systems. The needs and abilities of draft animals, fields, and human laborers were as important as the needs and abilities of machines. Farming people made industrial agriculture emerge within the relationships between mechanical and non-mechanical components of new technological systems.

⁸⁴ Pawley, *Nature of the Future*, invokes the theoretical formulation of “sociotechnical imaginaries,” as defined in, Sheila Jasanoff, “Future Imperfect: Science, Technology, and the Imaginations of Modernity,” in *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*, ed. Sheila Jasanoff and Sang-Hyun Kim (Chicago: University of Chicago Press, 2015); Other historians have discussed the nineteenth-century valorization of scientific knowledge and approaches to farming, particularly among both “middle class” farmers and their allies in other professions. Bidwell and Falconer, 316-320, briefly discuss agricultural newspapers and agricultural societies as institutions of improvement; McClelland, *Sowing Modernity: America’s First Agricultural Revolution*, describes an American agricultural revolution beginning in the 1830s in the North; Blanke, *Sowing the American Dream*, sees the advance of scientific farming as connected to a growing nineteenth-century spirit of rural consumerism. For more on the nineteenth-century project of agricultural improvement in the North, see Benjamin R. Cohen, *Notes from the Ground: Science, Soil, and Society in the American Countryside* (New Haven: Yale University Press, 2009); Albert Demaree, *The American Agricultural Press, 1815-1860* (New York: Columbia University Press, 1941); Donald Marti, *To Improve the Soil and the Mind* (Ann Arbor: University Microfilms, 1979); Margaret Rossiter, “The Organization of Agricultural Improvement in the United States, 1785-1865,” in *The Pursuit of Knowledge in the Early American Republic*, ed. Alexandra Oleson and Sanborn C. Brown (Baltimore: John Hopkins University Press, 1976), 279–97; Steven Stoll, *Larding the Lean Earth: Soil and Society in Nineteenth-Century America* (New York: Hill and Wang, 2003); Eric C. Stoykovich, “The Culture of Improvement in the Early Republic: Domestic Livestock, Animal Breeding, and Philadelphia’s Urban Gentlemen, 1820-1860,” *The Pennsylvania Magazine of History and Biography* 134, no. 1 (January 2010): 31–58. For improvement in a Southern context, see, Joyce Chaplin, *An Anxious Pursuit: Agricultural Innovation and Modernity in the Lower South, 1730-1815* (Chapel Hill: University of North Carolina Press, 1996); William Thomas Okie, *The Georgia Peach: Culture, Agriculture, and Environment in the American South* (Cambridge: Cambridge University Press, 2016).

Machine Purchase and the Agents of Capitalism

Grain drills, reapers, threshers, and fanning mills, alongside sewing and washing machines, began to make their way through the Midwestern countryside in the 1840s. These machines were present to some extent in earlier decades, especially in Britain, but the 1840s and 1850s saw some of the first attempts to manufacture machines on a large scale in the United States. Manufacturers often sold machines through local agents who were tasked with displaying machines, canvassing for sales, and sometimes handling delivery. These agents were, like urban business clerks, on the front lines of the expansion of capitalism.⁸⁵ They also brought manufactured products to farmers, who then brought industrial capitalism itself to their farms in their use of those products. While some agents were still farmers themselves who served as agents on the side more to get access to machines for their communities than to build a profit-seeking career, these agents still introduced machines to the farmers' world through commercial and financial capitalism.

Machine companies and their agents began advertising in agricultural newspapers as soon as manufacturers produced them on a significant scale. Early advertisements in sometimes included descriptions, testimonials, and schematics that introduced farmers to the machines, as well as to the local agent of the McCormick company, William H. H.

⁸⁵ Michael Zakim, *Accounting for Capitalism*; Michael Zakim, "Producing Capitalism: The Clerk at Work," in *Capitalism Takes Command*, 223-248; Michael Zakim, "The Business Clerk as Social Revolutionary; or, a Labor History of the Nonproducing Classes," *Journal of the Early Republic* 2, no. 4 (Winter 2006): 563-603; Blanke, 66-93, also points to business agents of consumer goods as builders of rural consumerism.

Taylor.⁸⁶ In 1847, McCormick moved to Chicago. By 1849, the material quality of the firm's Chicago-manufactured reapers prompted McCormick advertisements to declare them "no longer an experiment."⁸⁷ As the 1840s inaugurated the American reaper industry, other reaper manufacturers advertised their machines in the following years and machine company agents moved west alongside farmers.⁸⁸

Company agents came from a number of different types of occupations as manufacturers recruited local people in order to build a consumer base for their products. Field machines agents were nearly all men, but the opportunity to serve as agent of a sewing machine manufacturer was open to women as well. Agents for the Singer Sewing Machine Company were initially drawn from the mechanics who worked in the factory in New York City, but it is not clear how many of these made it to the rural Midwest.⁸⁹ Seeking agents within the communities they hoped to enter, sewing machine companies

⁸⁶ "McCormick's Virginia Reaper." *Ohio Cultivator*, March 15, 1845, 47. Hathi Trust Digital Library. <https://catalog.hathitrust.org/Record/008606812>.

⁸⁷ "McCormick's Patent Virginia Reaper," 1849, McCormick Mss 5X, Box 1, Folder 2., McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society; "McCormick's Reaper." *Prairie Farmer*, December 1850, 13. University of Illinois Digital Newspaper Collection. <https://idnc.library.illinois.edu/?a=cl&cl=CL1&sp=PFR&e=-----en-20--1--img-IXIN----->.

⁸⁸ Ardrey, 40-48; Rogin, 72.74, Cyrus McCormick began to manufacture hundreds of reapers in Cincinnati and would enlarge his operation in Chicago by the end of the 1840s. He also licensed a firm called Seymour and Morgan in Brockport, New York to manufacture 100 reapers in 1845. Obed Hussey, a rival claimant to be inventor of the reaper, had made a handful of machines in the 1830s, but did not match McCormick's growth in the 1840s. On the differences between Hussey's and McCormick's reapers, see also Bidwell and Falconer, *History of Agriculture in the Northern United States*, 286-290; "Fair of the Mechanics' Institute." *Prairie Farmer*, December 1848, 376; "Hussey's Mowing and Reaping Machine." *Prairie Farmer*, December 1850, 5. For comparisons with other early reapers, see "Cook's Reaping Machine." *Ohio Cultivator*, April 15, 1846, 57; "Manny's Harvester." *Prairie Farmer*, November 1849, 347; "Atkins and Manny's Reaper Trial." *Prairie Farmer*, August 1854, 302; "Kirby Harvester." *Prairie Farmer*, May 17, 1860, 319; "Atkins Improved Harvester." *Prairie Farmer*, January 1851, 28.

⁸⁹ Davies, *Peacefully Working to Conquer the World*, 19.

solicited both male and female agents, likely hoping that female agents would have an easier time selling in their local communities by visiting with other women.⁹⁰ Over the 1850s and 1860s, a corps of business agents responsible for the sale, financing, and distribution of these new products grew in the rural Midwest and Ontario.

Company agents who were farmers themselves connected manufactured goods to the rural worlds they came from. Their positions within manufacturing companies could be a supplement to their primary business as small proprietors. Farmer-agents for McCormick balanced the work of selling and distributing machines with their farm work.⁹¹ Even those who were not farmers themselves often had family connections to local farmers in their territories.⁹² Travelling threshermen also sometimes worked as agents for thresher manufacturers and sold machines while operating their own.⁹³ While engaging in the business world, farmer agents and their families remained thoroughly involved in local relationships of farm life and labor. These local connections and levels

⁹⁰ *Godey's Lady's Book*, July 1867, vol. 75, pg. 1; "Ten Dollar Novelty Sewing and Embroidering Machine" (Masury and Brooks, Boston, n.d.), Box 2, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/4973/>. For examples of women sewing machine agents in the Midwest, see, Etta May Lacey Crowder, "Pioneer Life in Palo Alto County: Memoirs of E. May Lacey Crowder," *Iowa Journal of History and Politics* 46, no. 2 (April 1948), 179. For other women agents for sewing machine companies, see, "Sprake's Photograph Gallery." *Grange Advance*, December 8, 1873, 2. Minnesota Historical Society Digital Newspaper Hub. <https://newspapers.mnhs.org/jsp/PsBrowse.jsp>.

⁹¹ Unknown Author to Cyrus Hall McCormick, October 28, 1867, McCormick Mss 2X, Micro 2021, Reel 60, Frame 757, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society; William B. Silver to Cyrus McCormick, May 22, 1867, McCormick Mss 1A, Box 25, Cyrus Hall McCormick Correspondence and Subject File, 1788-1939, Wisconsin Historical Society, [Hereafter C.H.M. Correspondence].

⁹² Samson Howell, "Diary," June 17, 1869.

⁹³ Martin Light Wenger, *Wenger Memoirs and Autobiography* (South Bend, IN: C. B. Hibbern, 1898), 64-68; William R. Brown and Mitchell Y. Jackson, *Minnesota Farmers' Diaries: William R. Brown, 1845-46, Mitchell Y. Jackson, 1852-63.*, ed. Rodney Loehr (Saint Paul: Minnesota Historical Society, 1939), 91-95.

of trust allowed agents to introduce machines into rural communities and contributed to the acceptance of them among farmers.

Some agents' entrepreneurial pursuits took them further off the farm and into a career at the intersection of rural and urban capitalism. Many machine agents were also merchant dealers in a range of agricultural necessities. Dealer-agents became common in the McCormick system by the end of the 1850s.⁹⁴ McCormick barred agents from selling other types of reapers or mowers, but dealers would often sell other the machines of other firms. These agents simply added machine sales to their existing activities as commercial capitalists.

As the agency structures of companies like Singer's and McCormick's grew, some agents began to make more of a career out of their operations. "General agents" and "local agents" were distinct from the "sub-agents" they hired to work within their territories. Some agents, like John Edgar of Minnesota, hired sub-agents on salaries as high as \$800 a year, indicating that some sub-agents made a career out of the work, as some local agencies became large operations in their own right.⁹⁵ Yet even among general and local agents there could be differences in commissions and sales numbers. One McCormick local agent's contract from 1871, for instance, set the agent's commission at 8% for machine sales. Agents or sub-agents for other companies appear to

⁹⁴ S.D. Underwood to Cyrus Hall McCormick, July 13, 1860, McCormick Mss 1A, Box 16, C.H.M. Correspondence.

⁹⁵ John Edgar to Cyrus Hall McCormick, December 11, 1873, McCormick Mss 1A, Box 48, C.H.M. Correspondence.

have had similar commissions.⁹⁶ On the other hand, an established general agent with a number of sub-agents beneath him had an 18% commission.⁹⁷ Other machine companies paid similar, or even higher commissions.⁹⁸

Enterprising agents could also make a living in the sewing machine industry. The earliest agents of the Singer Sewing Machine Company were paid a weekly salary of \$15, raised to \$20 in 1858; married agents received an addition \$6 a week for the assistance of their wives. As well, commissions existed among other sewing machine agents. The Singer Sewing Machine Company sold territorial rights to manufacture its machines, but moved towards an agency system once the capital was available to do so.⁹⁹ The *Ohio Farmer* reported that a sewing machine agent in Mount Vernon, Ohio, made \$22.85 on each sewing machine sold, though the paper did not report the sales cost of the machines in question.¹⁰⁰ These agents either set up shop with a store room in town or canvassed local areas to sell their company's machines.¹⁰¹ While it was often husbands who made final decisions about whether to purchase a sewing machine, farm women interacted with

⁹⁶ C. W. Flinn to Samuel Flinn, March 22, 1870, Flinn Family Correspondence, Huntington Library, San Marino, California.

⁹⁷ "Contract," October 1, 1871, McCormick Mss 5X, Box 1, Folder 32, McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society; "Contract," Frank A. Craycroft, December 1, 1883, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

⁹⁸ John Edgar to Cyrus Hall McCormick, August 16, 1873, McCormick Mss 1A, Box 48, C.H.M. Correspondence.

⁹⁹ Jack, "The Channels of Distribution for an Innovation: The Sewing-Machine Industry in America, 1860-1865," on early Singer agents' pay, in particular, see Jack, 123; Brandon, 129-135; Hounshell, 91-92.

¹⁰⁰ Grange Items. *Ohio Farmer*. Vol. 48, no. 18. October 30, 1875, 279. <https://www-proquest-com.proxy.wm.edu/publication/35902?accountid=15053>.

¹⁰¹ *Grange Advance*, August 25, 1875, 8.

agents as well.¹⁰² Serving as an agent for machine companies became a career established by the growth of both rural and urban capitalism.

Some agents embraced their business with the company as a larger part of their daily work, those who were most dedicated to finance and profit-seeking came to facilitate the majority of the trade. McCormick agents' sales reports reveal that a good portion of sub-agents, and even some local agents, might sell only one or two machines in a season while others sold hundreds.¹⁰³ The same was likely true of sewing machine agents. Etta May Lacey's Aunt, for instance, only sold a few machines when serving as an agent for the Florence line of machines.¹⁰⁴ These agents who operated on a small-scale did not always last, however. One local McCormick agent wrote to the home office, "For many years, I have been selling machines for you, not so much to make a paying affair out of it, but I have got into it, more for an accomodation, to my neighbours, and people in this section of Iowa, then [sic] for anything else."¹⁰⁵ The agent cast his operation not in the terms of a capitalist entrepreneur but in terms of a farmer who was endeavoring to connect both himself and his community to new machines. He thus offered a version of the farm machine industry from the perspective of farmers who wanted machines to

¹⁰² Connolly, 134-137; Connolly points to Emily Hawley Gillespie as an example of a farm woman who was able to purchase a sewing machine with money of her own that she set aside from her poultry-raising. Gillespie, 155; Sarah Gillespie Huftalen, *All Will Yet Be Well: The Diary of Sarah Gillespie Huftalen, 1873-1952*, ed. Suzanne L. Bunkers (Iowa City: University of Iowa Press, 1993), 57.

¹⁰³ "Sales Book of 1860" (McCormick Company, 1860), McCormick Mss 1A, Box 15, C.H.M. Correspondence; H. J. Prier, "Preliminary Report of the State of Indiana," 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

¹⁰⁴ Crowder, 179.

¹⁰⁵ H. Van Houten to C. H. McCormick and L. J. McCormick, June 23, 1877, McCormick Mss 1A, Box 70, C.H.M. Correspondence.

alleviate labor and increase production, but who also sought stability as much as growth. Yet by the mid-1870s, this agent was on bad terms with McCormick and the relationship between them did not last, though it is difficult to say if they conflict had to do with differences between the agent's goal to serve his community and the company's goal to maximize sales. What is clear is that, over the middle decades of the century, company agency structures developed into a sophisticated profit-seeking endeavor for manufacturers and their most dedicated agents.

These company agents connected farmers to the manufactured products of industrial capitalism. Agents and farmers would come into conflict with one another as commercial and financial capitalism bore heavily on farmers. Before then, however, farmers made machines into components of new technological systems and would also make claims about their own abilities to participate directly in the construction of industrial agriculture as equal partners.

Machine Knowledge, Participatory Enthusiasm, and the Farm Press

News about machines spread through the farm press and by machine manufacturers themselves, who championed the cause of mechanization. Farming people began to develop machine knowledge as they encountered new technologies at displays, in newspapers, and in their rural communities. As they cultivated machine knowledge,

farmers also asserted their rights and abilities to participate as equal partners in the industrialization of grain agriculture.

Knowledge of new machines spread into the Midwest through institutions invested in the development of the region, especially the farm press. The rural mail, bolstered by emergent technologies including the railroads and telegraphs, circulated correspondence as well as a variety of newspapers. By the 1860s, continued expansions of the American postal system through the proliferation of rural star routes and the introduction of free city delivery services helped spread information throughout the Midwest, albeit with greater extent and haste to the cities than the country.¹⁰⁶ Agricultural newspapers were among the items shipped.

The farm press hosted constant discussion of agricultural improvement and machinery. The early advertisements for mechanical reapers in the farm press were quite detailed. While a local McCormick agent deemed it “unnecessary to enumerate all the different parts of the machine, as any farmer or mechanic will obtain a good general idea of its construction and mode of operation, from a glance at the annexed cuts,” he nonetheless included several paragraphs of explanation for the images. Advertisements

¹⁰⁶ For the extents and limitations of rural mail services in these decades, see, David M. Henkin, *The Postal Age: The Emergence of Modern Communications in Nineteenth-Century America* (Chicago: University of Chicago Press, 2008), 31-32; Wayne E. Fuller, *The American Mail: Enlarger of the Common Life* (Chicago: University of Chicago Press, 1972), 74-75; Winifred Gallagher, *How the Post Office Created America* (New York: Penguin, 2016), 174-176; Lena Bedenbender Hecker, “The History of the Rural Free Mail Delivery in the United States” (State University of Iowa, 1920), 17-20, 25. For the mail as the deliverer of newspapers, see, Richard R. John, *Spreading the News: The American Postal System from Franklin to Morse* (Cambridge: Harvard University Press, 1998), 39-40. For the relationship between the mail and railroads, see, Fuller, 166-169, and, Carl H. Scheele, *A Short History of the Mail Service* (Washington: Smithsonian Institution Press, 1970), 92-99, 103-105.

like this offered an initial piece of machine knowledge.¹⁰⁷ The farm press also reported on machines as the subject of newsworthy stories. The *Ohio Cultivator* reported on the numbers of machines estimated to be in operation in their locales along with descriptive accounts and evaluations.¹⁰⁸ Some of these articles responded to inquiries from farmers curious about reapers in general or about the manufacturing operations of different companies.¹⁰⁹ Farmers also read about and discussed other kinds of grain harvesters. There were several larger harvesters, some of which incorporated the process of removing the grain from the chaff into the harvest process itself.¹¹⁰ Although many things seemed possible during what one article described as the “infancy” of this line of technological development, reapers would become the most common grain harvester in these decades.¹¹¹

¹⁰⁷ See Figure 2. “McCormick’s Virginia Reaper.” *Ohio Cultivator*, March 15, 1845, 47.

¹⁰⁸ “Harvesting Machines.” *Ohio Cultivator*, October 1, 1846, 147.

¹⁰⁹ “Extracts and Comments.” *Union Agriculturalist and Western Prairie Farmer* [hereafter, *Prairie Farmer*], June 1841, 45; “Hussey’s Reaping Machine.” *Ohio Cultivator*, February 15, 1847, 26; Editorial Correspondence. *Prairie Farmer*, August 1848, 234; On McCormick’s troubled early expansion into Southern Ohio, see, “McCormick’s Reaper Improved.” *Ohio Cultivator*, April 1847, 57; Editorial Correspondence. *Prairie Farmer*, August 1848, 234; Cyrus Hall McCormick to William S McCormick, August 6, 1845, McCormick Mss 1A, Box 3, Folder 30, C.H.M. Correspondence.

¹¹⁰ “Churchill and Danford’s Harvesting Machine.” *Prairie Farmer*, August 1841, 61; “Harvesting and Threshing Machines Out West,” *Ohio Cultivator*, October 1, 1850, 298; Charles L. Hill. *The First Combine. The Wisconsin Magazine of History*, Vol. 35, No. 4 (Summer, 1952): 263-266; “Esterly’s Harvester.” *Prairie Farmer*, September 1849, 281; “Esterly’s Harvester.” *Ohio Cultivator*, June 1, 1850, 163-164.

¹¹¹ “Harvesters.” *Prairie Farmer*, September 1, 1846, 284.

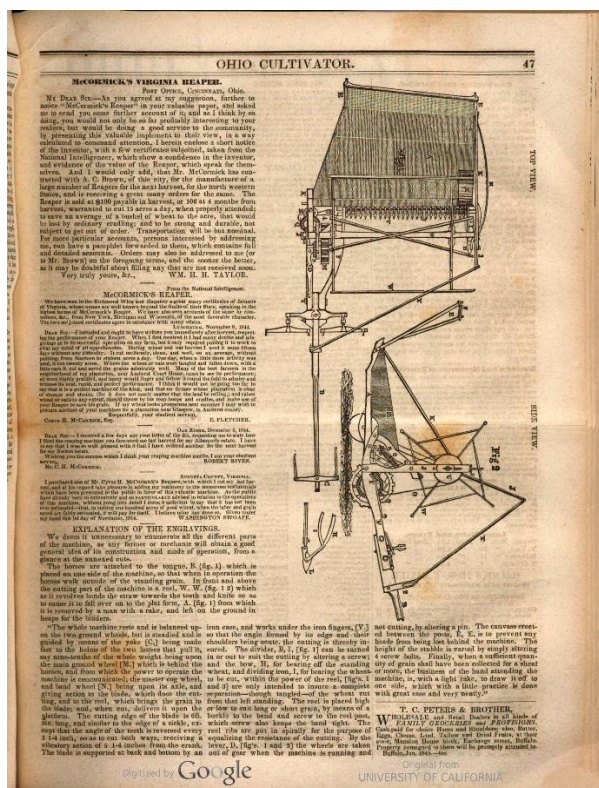
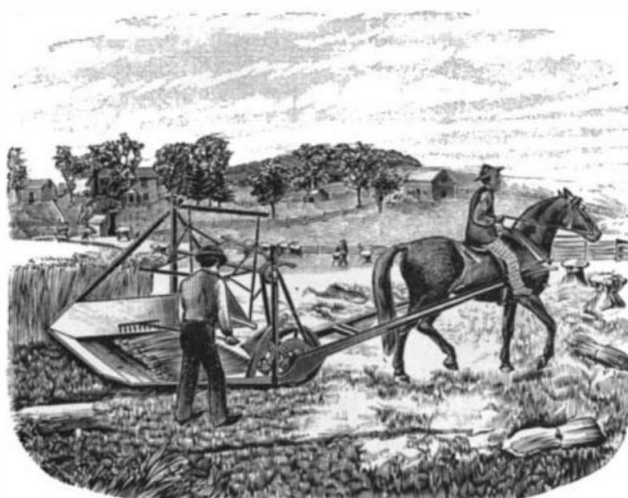


Figure 2: “McCormick’s Virginia Reaper.” *Ohio Cultivator*, March 15, 1845, 47. Hathi Trust Digital Library. <https://catalog.hathitrust.org/Record/008606812>.

Farmers expressed their enthusiasm for, and participation in, mechanization in agricultural newspapers. One farmer wrote to the *Ohio Cultivator* in 1847 to discuss both reapers and mowers—which were quite similar to reapers but cut grasses instead of grains. He first discussed the merits of the McCormick reaper, which he considered “strong and durable in every part except the reel, which needs to be made with an additional set of arms in the middle, and better gudgeons.” By offering this suggestion, the farmer asserted his ability to participate as an equal partner with manufacturers in the mechanization of agriculture. He ended his letter with a call for “a machine that would

mow like McCormick's reaper cuts grain, from 15 to 20 acres per day."¹¹² His hopes came to fruition when McCormick began to advertise the Virginia reaper as a good mower as well.¹¹³ Manufacturers filled the market with a plethora of mowing machines, some of the earliest of which were sold as combined reaper-mowers.¹¹⁴ Farmers participated in the enthusiasm for continued mechanization expressed in the farm press and asserted themselves as participants in it.



*Figure 3: An illustrated depiction of Cyrus McCormick's reaper as built on his farm in Virginia in the 1830s. Later reapers would feature improvements that allowed the raker to sit on the machine and that allowed the machine to serve as a mower as well as a reaper. "Agricultural Machinery," *Scientific American*, July 25, 1896, 74-76. JSTOR.*

¹¹² "Mowing Machine." *Ohio Cultivator*, September 1, 1847, 123.

¹¹³ Cyrus Hall McCormick, "McCormick's Reaper and Mower, Warranted to Be the Best in Use," 1858, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

¹¹⁴ Ardrey, 79-80. For informative advertisements of mowers, see, "Ketchum's and Hussey's Mowing Machine." *Ohio Cultivator*, October 1, 1848, 145-146; "Ketchum's Reaping and Mowing Machine." *Ohio Cultivator*, February 1, 1849, 37-38. For similar advertisements for ascendant combined machines, see, "Another Reaper and Mower." Editors' Table. *Prairie Farmer*, January 1851, 41; George Hildt, "The Diary of George H. Hildt," ed. Martha B. Caldwell, *Kansas Historical Quarterly* 10, no. 3 (August 1941): 278, demonstrates that combined reaper-mowers were such a feature of the industry that some farmers could not find single-purpose reapers when they sought them out.

<https://www.jstor.org/stable/pdf/26119797.pdf?refreqid=excelsior%3A1e0379d371add6a1680aac178ffd17>
59

Farmers claimed the same ability and right to direct the mechanization of agriculture in their discussions of grain drills—devices that planted small grain seeds evenly. The 1830s saw a series of new patents granted for drills in the United States that manufacturers built upon further in the next decades.¹¹⁵ The agricultural papers of the 1840s covered them in a similar manner to their coverage of reapers and mowers.¹¹⁶ The farm press, and farmers who contributed to it, touted the ability of drills to plant seeds evenly and deep enough to protect winter wheat from freezing out in the cold months.¹¹⁷ One farmer wrote in to the *Prairie Farmer*, in 1849, to opine that a good grain drill, alongside a reaper and a thresher, was one of the three most necessary machines for any farmer.¹¹⁸ In putting this opinion forward, the farmer asserted not only the importance of the machine to the farm, but also of farmers’ perspectives to the project of agricultural industrialization.

¹¹⁵ Ardrey, 26-29; Bidwell and Falconer, *History of Agriculture in the Northern United States*, 299-300.

¹¹⁶ “Emery’s Albany Seed Planter.” *Prairie Farmer*, September 1848, 275; “Pierson’s Drill.” *Prairie Farmer*, January 1851, 39; *Ohio Cultivator*, October 15, 1845, 156; “Farmers’ and Mechanics Exhibition at Dayton.” *Ohio Cultivator*, November 1, 1845, 162; “Drilling Wheat in Pennsylvania.” *Ohio Cultivator*, December 15, 1847, 188; “Palmer’s Grain Drill or Sowing Machine.” *Ohio Cultivator*, November 1, 1848, 152.

¹¹⁷ “Letter from Mr. Noble.” *Ohio Cultivator*, April 15, 1846, 162-163.

¹¹⁸ “Relating to Machines.” *Prairie Farmer*, September 1849, 281.



Figure 4: "Pierson's Patented Seed Drill." *Prairie Farmer*, January 1, 1851, p. 45.

Threshing machines, like wheat drills, had existed in Britain for decades prior to the 1840s, but American farmers did not use them until the mid-nineteenth century. American manufacturers began to patent and sell larger and more reliable machines in the 1850s.¹¹⁹ Newspapers discussed and advertised these machines along with others and provided information about their workings as well.¹²⁰ Where the drills, mowers, reapers, and harvesters mentioned above were powered by the movement of horses when pulled along, threshers were stationary while in operation. The “power” ran the thresher. In these decades powers took the forms of “horse-sweep”—which had horses walk around

¹¹⁹ Ardrey, 103-114; Rogin, 157; Some farmers used fanning mills to mechanically generate a breeze to separate the grain from the chaff. These were also advertised in agricultural newspapers. See, for example, “Dickey’s Fanning Mill.” *Prairie Farmer*, August 1856, 256.

¹²⁰ Advertisements. *Ohio Cultivator*, April 15, 1847, 64; “Threshing Machines.” *Ohio Cultivator*, June 15, 1848, 96.

the power in a circle—or horse treadmill. Steam-powered threshers would become a presence in later decades.¹²¹ Farmers learned of these machines through the farm press and contributed to their adoption by participating in the mid-century enthusiasm for mechanization.



Figure 5: Image from an advertisement for a treadmill horse power for threshing machines. "Wheeler's Horse Power." *Prairie Farmer*, May 1, 1854, p. 204.

Further north, Canadian farmers asserted a similar enthusiasm for, and ability to participate in, the mechanization of agriculture. They read similar discussions in their own national farm press. The *Canadian Agriculturalist* of Toronto, and other farm papers, were delivered by provincial mail services and later the federal Post Office.¹²² Threshing machines appeared earlier than reapers and mowers because the Canadian farm press discussed threshing machines at work in Britain that were not yet in North

¹²¹ Rogin, 175-76; Bidwell and Falconer, *History of Agriculture in the Northern United States*, 297-299.

¹²² William Smith, *The History of the Post Office in British North America, 1639-1870* (Cambridge: Cambridge University Press, 1920); Ian R. Lee, "The Canadian Postal System: Origins, Growth and Decay of the State Postal Function, 1765-1981" (Ottawa, Carleton University, 1989).

America.¹²³ Reapers and mowers began to receive greater consideration in the early 1860s, as American manufacturers issued licenses in Ontario and Canadian manufacturers sold their own machines.¹²⁴ The *Canadian Agriculturalist* identified manufacturer Daniel Massey as the “Reaper King” in Canada in 1861.¹²⁵ As the farm press in Ontario reported on new machines and how to use them, Canadian farmers declared themselves active contributors to the mechanization of agriculture alongside manufacturers.

Farming people also learned of sewing and washing machines, and farm women asserted their own authority to participate in mechanization. Sewing machine manufacturers who would go on to be the prominent forces in the industry like the Singer Sewing Machine Company, Wheeler and Wilson, and Willcox and Gibbs entered the business in the 1850s.¹²⁶ Washing machines were less common, and the industry was less concentrated among a few manufacturers, but farmers learned of these machines as well. Overall, however, sewing machines and washing machines received less attention in the agricultural press than field machines. Rural women were aware of this disparity. The *Ohio Cultivator* “Housewife’s Department” discussed an English washing machine. The author described the machine’s operations, but also lamented that the machines of

¹²³ “Steam Applied to Agriculture.” *Canadian Agriculturalist*, October 1849, 325. Canadiana Online. https://www.canadiana.ca/view/oocihm.8_04016; “Threshing Machines.” *Canadian Agriculturalist*, September 1850, 199; “Farm Implements and Machinery.” *Canadian Agriculturalist*, January 16, 1861, 41.

¹²⁴ “The Machinery of Agriculture.” *Canadian Agriculturalist*, December 16, 1860, 631; “Reaping Machines.” *Canadian Agriculturalist*, August 16, 1861, 485.

¹²⁵ “Manufacturers.” *Canadian Agriculturalist*, January 16, 1861, 58. For more on Massey and the leading firms in Canada that developed out of this early manufacturer, see, Quick and Buchele, 131-146.

¹²⁶ Brandon, 34-140; Hounshell, 68; Godfrey, *An International History of the Sewing Machine*, 83-125.

women's work had been given less attention than those associated with men's work in the field.¹²⁷ An Ontario farm woman similarly lamented to the *Canadian Agriculturalist* in 1861 that sewing machines warranted more attention.¹²⁸ Other farming women also wrote to newspapers to ask for more information about sewing machines.¹²⁹ These farm women thus claimed a space for themselves in the mechanization of agriculture by asserting the importance of the farm home to that project.¹³⁰

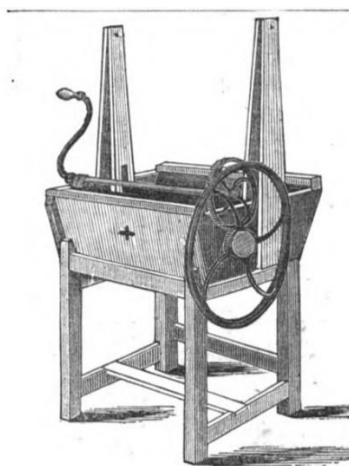


Figure 6: Image of the English "Rich's washing machine" discussed in, "Housewife's Department: Conducted by Mrs. Bateham." *Ohio Cultivator*, February 1, 1848, 23.

¹²⁷ "Housewife's Department: Conducted by Mrs. Bateham." *Ohio Cultivator*, February 1, 1848, 23.

¹²⁸ "Sewing Machines." *Canadian Agriculturalist*, February 1, 1861, 82; See also "Sewing Machine." *Canadian Agriculturalist*, April 2, 1849, 111.

¹²⁹ See, for instance, *American Agriculturalist*, April 1858, quoted in Connolly, 77.

¹³⁰ For discussions of and advertisements for sewing machines, see, "New Sewing Machine." *Ohio Cultivator* January 1, 1853, 14; "Letter from Mrs. Gage." *Ohio Cultivator*. January 15, 1853, 30; "List of New Patents." *Ohio Cultivator*, April 1, 1853, 99; "Housewife's Department." *Ohio Cultivator*, October 15, 1854, 316. For washing machines, see, *Ohio Cultivator*, March 1854; "The Best Washing Machine." *Ohio Cultivator*. April 1, 1858, 110.

THE CALKINS'
CHAMPION WASHER.

(PATENTED OCTOBER 17, 1871.)

The Great Achievement of the 19th Century.



Figure 7: "The Calkins Champion Washer." *Ladies' Own Magazine*, May 1872, 234.
<https://catalog.hathitrust.org/Record/006057886>

The editors of women's magazines and manufacturers likewise promoted the mechanization of the household. *Godey's Lady's Book* and *Peterson's Magazine* advertised and discussed sewing and washing machines frequently in the 1850s and 1860s.¹³¹ *Godey's* used a language of progress in its discussions of sewing machines and others that "lighten woman's labor" that resembled the farm press discussion of reapers and mowers.¹³² Meanwhile, manufactures of sewing machines published pamphlets with descriptions and images of the machines' various parts as well as directions for threading

¹³¹ "The Best Sewing Machines." *Godey's Lady's Book*, August 1859, vol. 59, 184. Hathi Trust Digital Library. <https://catalog.hathitrust.org/Record/000050287>; Advertisements. *Godey's Lady's Book*, December 1859, vol. 59, 569; Looking back from 1876, *Godey's* identified Howe's sewing machine in the mid-1840s as the true introduction of the machine and this popular memory parallels the expansion of reapers and mowers in the mid-1840s. "The Sewing Machine." *Godey's Lady's Book*, August 1876, vol. 93, 194; Editor's Table. "An Important Improvement." *Peterson's*, November 1861, 389; Editor's Table. "A Good Sewing Machine." *Peterson's*, February 1867, 155; Editor's Table. "The Florence Sewing Machine." *Peterson's*, June 1867, 462; Washing machines were mentioned less frequently. See, Advertisements, "The Calkins' Champion Washer." *Ladies' Own Magazine*, May 1872. Hathi Trust Digital Library. <https://catalog.hathitrust.org/Record/006057886>; "The Calkins Champion Washer." *Ladies' Own Magazine*, May 1872, 234; "The Champion Washer." *Ladies' Own Magazine*, June 1872, 285.

¹³² "A True Friend." *Godey's Lady's Book*, February 1861, vol. 62, 190.

the machine, running it, and adjusting the tension among other parts of the sewing process.¹³³ Women also wrote to magazines with instructions for others about how to operate machines. They performed a public service based on their machine knowledge and capabilities.¹³⁴ Women thus asserted their own abilities to contribute to the mechanization of the household by sharing information with each other .

Farming people articulated enthusiasm for new technologies regardless of the capacities or inclinations of manufacturers to supply them through speculation about the future of farm machines. In 1851, a contributor to the *Prairie Farmer* offered the idea of a machine in which binders did not follow after, but instead rode on the machine.¹³⁵ This idea would become an important component of a popular machine called the “Marsh harvester” in the 1870s, but newspaper readers and contributors anticipated this design decades earlier.¹³⁶ Farming people foresaw other potential machines as well, and women’s magazines also engaged in some technological forecasting from the 1850s on. *Godey’s Lady’s Book* featured an article by one woman who expressed a desire for someone to invent a “darning machine” for stockings.¹³⁷ In speculating about the types of

¹³³ “Instruction Book for the Howe Sewing Machine Step Feed” (1867), Box 1, Folder 2, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/0863/>.

“Directions for Using the Buckeye Sewing Machine” (Cleveland, OH, n.d.), Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/0805/>.

¹³⁴ “How to Quilt on a Wheeler and Wilson Machine.” Notes and Queries. *Godey’s Lady’s Book*, January 1860, vol. 60, 90; Anne Warner. “A Challenge from a Lady.” *Godey’s Lady’s Book*, January 1869, vol. 78, 102.

¹³⁵ “Reapers.” Comments. *Prairie Farmer*, March 1851, 136-137.

¹³⁶ For another example of farmers anticipating new designs, see, “New Reaper.” *Farmers’ Union*, June 15, 1872, 7. Microfilm. Minnesota Historical Society.

¹³⁷ “Darning Stockings.” *Godey’s Lady’s Book*, June 1860, vol. 60, 528.

machines that farmers could use in the future, farming people again asserted their place as participants in the development of mechanization.¹³⁸

The farm press also sought to bolster the mechanical ability of farmers to participate in industrialization through mechanical labor and knowledge. Both the *Ohio Cultivator* and the *Prairie Farmer* had sections of the paper designated as a “Mechanical Department” during these years. The mechanical departments included other technological news alongside discussion of machines. The *Prairie Farmer*’s mechanical department began with a producerist declaration of unity of interest between “farmers and mechanics,” who shared a common interest as working people but nonetheless, “don’t know enough of each other.”¹³⁹ But if the goal of the *Prairie Farmer* mechanical department was to draw together two separate populations, its editor, John Gage, also believed that ordinary farmers should cultivate mechanical skills in the interest of maintaining their own independence despite the specialization that came with industrialization in both manufacturing and agriculture. He wrote, “The idea that some men cannot be mechanics is erroneous, and should be thrown out of the vocabulary of sayings.”¹⁴⁰ The *Ohio Cultivator*’s mechanical department also sought to make every farmer into his own mechanic—a proposition which would only be made less likely as more complicated machines entered the market with each decade. The *Cultivator* printed a series of excerpts from “Lardner’s Popular Lectures on Science and Art” concerning the

¹³⁸ For more on the speculative technological imaginations of nineteenth-century Americans, see, Segal, *Technological Utopianism in American Culture*.

¹³⁹ Mechanical Department. *Prairie Farmer*, January 1843, 19.

¹⁴⁰ “The Study of Mechanics.” *Prairie Farmer*, October 1843, 227.

“elementary principles of mechanics.” The *Canadian Agriculturalist* ran articles seemingly taken from the same publication for farmers in Ontario to read. These included several discussions of the types of “simple machines”—inclined planes, wedges, screws, pulleys, levels, wheels, and axles—that modern physics had begun to consider the building-blocks of all mechanics, including the new machines that would come to populate grain farms.¹⁴¹ These ideas followed from producerist ideologies about the ability of citizens to produce their own livelihoods, but they also helped to foster mechanical ability among the users of farm machines.

Farming people also encountered machines in person. Some farmers first heard about machines from the traveling agents of machine companies.¹⁴² Fairs and public trials held by local agricultural societies were an important space for the display of machines. Historians often point to the grand displays at the London Exhibition of 1851, the Philadelphia Centennial of 1876, and the Columbian Exhibition of 1893, as opportunities

¹⁴¹ The original publishers of these lectures were listed in the *Ohio Cultivator* as Greely and M’Elerath of New York. The editor of the *Ohio Cultivator* first recommended these lectures to “young farmers and mechanics” in several issues in 1845. “Lectures on Science and Art.” *Ohio Cultivator*, August 1845, 124; “Editorial Notices.” *Ohio Cultivator*, September 1, 1845, 132; The editor received permission to print excerpts in December 1845. “Our Mechanic Friends.” *Ohio Cultivator*, December 15, 1845, 188; The *Cultivator* then printed several excerpts throughout the year, beginning in 1846. “On the Mechanic Powers.” *Ohio Cultivator*, January 1, 1846, 5-6; “On the Mechanic Powers.” *Ohio Cultivator*, January 15, 1846, 13-14; “On the Mechanic Powers.” *Ohio Cultivator*, February 1, 1846, 21-22; “On the Mechanic Powers.” *Ohio Cultivator*, June 1, 1846, 85-86. For example of an advertisement that describes the operations of a thresher in the same terms as these articles, with reference to pulleys and other simple machines, see “Emery’s Rail Road Horse Power and Threshing Machine.” *Ohio Cultivator*, January 15, 1851, 28; The *Canadian Agriculturalist* ran similar articles, without the publishing information, in 1850. “Natural Philosophy No. 4: On the Mechanical Powers.” *Canadian Agriculturalist*, May 1850, Vol. 2, No. 5, 114; “Natural Philosophy No. 5: On the Mechanical Powers.” *Canadian Agriculturalist*, June 1850, Vol. 2, No. 6, 142.

¹⁴² Harriet Connor Brown, *Grandmother Brown’s Hundred Years, 1827-1927* (Boston: Little, Brown and Co., 1929), 130.

for manufacturers like the McCormick company to make claims to inventive primacy and ideological import.¹⁴³ Ladies' magazines also reported on the trials of sewing machines at these kinds of grand exhibitions.¹⁴⁴ Yet ordinary rural people were more likely to see a variety of machines at local fairs. Nebraska farmer Benjamin Gue remarked of one of his trips to a local fair in the early 1850s that, immediately upon arriving, his eye was drawn to "the Mechanics Hall containing all sorts of Agricultural implements and machinery."¹⁴⁵ Ontario farmer John Ferguson remarked on the display of not only reaping, mowing, and threshing machines at a local fair, but also of sewing machines.¹⁴⁶ A trade catalog for Wheeler and Wilson sewing machines noted that their machines had been displayed at six Midwestern state fairs in 1863 and "at hundreds of County Fairs."¹⁴⁷ Regular state and county fairs often displayed machines and allowed farmers to get familiar with them. The Indiana State Fair of 1870, for which 33,000 tickets were

¹⁴³ Blanke, *Sowing the American Dream*, 48, points to the staging of local fairs as the most important contribution of farmers' clubs to Midwestern consumer culture and scientific farming. For discussions of the larger fairs and exhibitions, see, Winder, 147-178; Ott, "Producing a Past: Cyrus McCormick's Reaper from Heritage to History." PhD Dissertation. (Loyola University at Chicago, 2015), 40, 69-76; Pawley, *The Nature of the Future*, 81-100; See also, Bidwell and Falconer, 292-293.

¹⁴⁴ "Our Arm Chair-Paris Exhibition." *Peterson's*, November 1867, 390; "Our Arm Chair-Exposition Universelle." *Peterson's*, February 1868, 160.

¹⁴⁵ Benjamin F. Gue, *The Diary of Benjamin F. Gue in Rural New York and Pioneer Iowa*, ed. Earle D. Ross (Ames: Iowa State University Press, 1962), 51-53.

¹⁴⁶ John Ferguson, "John Ferguson 1873 Diary Transcripts" (1873), October 11, 1873, John Ferguson Diary Collection, Peel Art Gallery, Museum and Archives and Archives of Ontario. Accessed via Rural Diary Archive. <https://ruraldiaries.lib.uoguelph.ca/transcribe/collections/show/3>.

¹⁴⁷ Wheeler and Wilson, "The Sewing Machine" (New York, 1863), Box 4, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/0582/>. For discussions of farm machines at fairs and exhibitions in Ontario, see, *Canadian Agriculturalist*, April 1850, 82; Midwestern agricultural papers also reported that sewing machines were well represented at state and local fairs, alongside field machines. *Prairie Farmer*, September 26, 1868; *Prairie Farmer*, October 10, 1868.

sold, was reported to have a large display of grain drills as well as “all the principal reapers and mowers being represented.”¹⁴⁸ Trials of specific types of machines were also held more sporadically, in which a committee of judges rated machines on their performance. One such trial took place at Springfield, Ohio, in 1852. The committee’s report not only gave information about how machines performed, but also advice about their general use and who should purchase them. Another trial was held at Springfield in 1870, which was at that time able to showcase machines of local manufacture like the Champion line of mowers and reapers.¹⁴⁹ While state agricultural societies or departments of agriculture often directed these displays, the presence of farmers and farming communities demonstrates their enthusiasm for, and participation in, the mechanization of agriculture.

State agricultural colleges were another institution that championed machines as part of progressive farming. Bolstered by the Morrill Act of 1862, state agricultural

¹⁴⁸ “Views at the State Fair.” *Wisconsin Free Democrat*, October 13, 1858, 4. *Readex: America's Historical Newspapers*. <https://infoweb-newsbank-com.proxy.wm.edu/apps/readex/doc?p=EANX&docref=image/v2%3A11FC920166F5A537%40EANX-1208931EA9833280%402399966-1208931F152AEE18%403-1208932079C57D60%40Views%2Bat%2Bthe%2BState%2BFair>; “The State Exposition. *Indianapolis Sentinel*. September 10, 1875: 4. *Readex: America's Historical Newspapers*. <https://infoweb-newsbank-com.proxy.wm.edu/apps/readex/doc?p=EANX&docref=image/v2%3A11B56245AD1D9352%40EANX-11C1A11B454211C0%402406142-11C1A11B603AC738%403-11C1A11BE41BD9C8%40The%2BState%2BExposition%2Bthe%2BOpening%2BLast%2BEvening>.

¹⁴⁹ “Report of the Committee on Reaping and Mowing Machines, at Trial at Springfield.” *Ohio Statesman*, July 12, 1852, 2. *Readex: America's Historical Newspapers*. <https://infoweb-newsbank-com.proxy.wm.edu/apps/readex/doc?>; “The Ohio State Fair at Springfield.” *Cincinnati Commercial Tribune*, September 15, 1870. 6. *Readex: America's Historical Newspapers*. <https://infoweb-newsbank-com.proxy.wm.edu/apps/readex/doc?p=EANX&docref=image/v2%3A1233E9DEDC3D81AB%40EANX-12522288432EAE98%402404321-12522288C5E41268%405-1252228A5CB3AFD0%40Agricultural%2BFairs%252C.%2BThe%2BOhio%2BState%2BFair%2Bat%2BSpringfield-Twenty-First%2BAnnual%2Bof%2Bthe%2BState%2BBoard%2Bof%2BAgricultural>.

colleges grew over the course of the second half of the nineteenth century. Yet their connection to, and support from, ordinary farmers was often weak, and their programs outside of agriculture were more successful than their efforts to train future farmers. Nevertheless, the colleges sponsored machine trials, through which farming people could learn more about machinery, and the Kansas State University even had a “Farm Machinery Hall,” on its campus in the 1870s. The early programs in domestic economy and other forerunners of the home economics movement of later decades also nearly always included sewing, likely by machine to some extent, in their curricula.¹⁵⁰

Despite the support of these institutions and of many farmers themselves, the promoters of machine use in the farm press worried that some farmers did not accept machines thoroughly enough. The *Ohio Cultivator* advocated progressive farming, or “book-farming,” even while acknowledging that book-farming was not universally popular among farmers.¹⁵¹ One progressive farmer by the name of C. Fincastle Brown wrote to the *Ohio Cultivator* that he hoped fewer farmers would be “men whose highest ambition seems to be to do as *daddy did*, or to carry the grain in one end of the bag, and

¹⁵⁰ For college-sponsored trials, see, Earle D. Ross, *A History of the Iowa State College of Agriculture and Mechanical Arts* (Ames: Iowa State College Press, 1942), 29-30. For Kansas State’s Farm Machinery Hall, see, James C. Carey, *Kansas State University: The Quest for Identity* (Lawrence: The Regents Press of Kansas, 1977), 54. For sewing and home economics, see, Ross, 130-131; Richard G. Moores, *Fields of Rich Toil: The Development of the University of Illinois College of Agriculture* (Urbana: University of Illinois Press, 1970), 177-181; Carey, *Kansas State University*, 44-45, 52; Richard S. Kirkendall, “The Agricultural Colleges: Between Tradition and Modernization,” *Agricultural History* 60, no. 2 (Spring 1986): 3-21, makes clear, however, that ordinary farming people were not very connected to the land-grant colleges until the twentieth century. Nineteenth-century farmers often regarded the schools with skepticism and the colleges’ agricultural programs struggled to directly impact the lives of farming people; See also, Roy Scott, *The Reluctant Farmer: The Rise of Agricultural Extension* (Urbana: University of Illinois Press, 1970), 64-103.

¹⁵¹ “Book-Farming-A Fact.” *Ohio Cultivator*, January 15, 1845, 8; “Editorial Correspondence.” *Prairie Farmer*, August 1848, 234.

the stone in the other, because *daddy's* granddaddy did so.”¹⁵² The farm press thus occasionally channeled the interests of manufacturers in its enthusiasm for the maximization of machine use. In fact, the same newspapermen who lauded machines and improvement in their publications sometimes served as machine company agents for the makers of field and household machines. Sewing machine manufacturers also sought out newspapermen as potential agents.¹⁵³

Machine companies, the farm press, and many farmers united to champion the cause of the mechanization of grain agriculture. Yet while manufacturers, agricultural societies, and newspaper editors took the lead in thrusting machines westward, ordinary farmers brought machines into their worlds and thus produced new technological systems. They chose to use machines or to use older implements, or to use combinations of both, in the context of the systems of production on their farms.

Family Labor Systems

Farming people did not learn about machines exclusively from company agents or the farm press, however, but more importantly from one another. They visited others' farms to see new machines.¹⁵⁴ Others might bring a machine on visits to neighbors' farms

¹⁵² “Necessity of Intellectual Improvement amongst Farmers and Mechanics.” *Ohio Cultivator*, March 1, 1847, 38.

¹⁵³ “Agency of Machines.” Editor’s Table. *Prairie Farmer*, November 1848, 357; Jack, “The Channels of Distribution for an Innovation: The Sewing-Machine Industry in America, 1860-1865,” 126.

¹⁵⁴ Elisabeth Koren, *The Diary of Elisabeth Koren, 1853-1855*, ed. and trans. David T. Nelson (Northfield, MN: Norwegian-American Historical Association, 1955), 287; John Campbell Bailey, “Diary” (1870), July

to let them try it.¹⁵⁵ As more farming people purchased and began to use machines, and more farmers encountered machines in their neighbors' fields, they located machine knowledge on the farm and marshalled machines together with their extant farm systems to produce new technological systems. One of ways farmers did so was by situating machines within their systems of organizing farm labor. The labor of family members, neighbors, and hired hands all contributed to the cultivation of small grains and to the maintenance of farm households. Some farmers, particularly those with large acreages and greater wealth, relied on hired agricultural labor. Farmers with smaller fields and smaller farming operations in general relied on their families and on the shared labor of local communities even when growing crops like wheat to sell. U.S. Census data lists the average size of farms in Midwestern states as between 120 and 190 acres during these decades, though the wealth of farming families also differed in terms of the amount of land cultivated and levels of profitability.¹⁵⁶ Yet farmers of different levels of means nonetheless began to incorporate machines into the social systems they most relied upon to organize labor. Farming people built industrial agriculture as they adapted machines to farm labor. There were some conflicts within farming communities about how and what

21, 1870, p. 36, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum; Samuel A. Randle, "Reminiscences" (Portland, Oregon, 1921), Mss HM 72866, Box 1, Thomas H. Hansbrow papers, Huntington Library, p. 72.

¹⁵⁵ John Campbell Bailey, "Diary" (1873), September 4, 1873, p. 46, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum, a neighbor of the Baileys brought a sewing machine on a visit so they could "try" it.

¹⁵⁶ "Table 13: "Average Acreage Per Farm of All Land in Farms, By Divisions and States" in *1940 Census Publications, Volume 3, Part 2: Size of Farms* (Washington: U.S. Census Bureau, 1940), <http://lib-usda-05.serverfarm.cornell.edu/usda/AgCensusImages/1940/03/02/1940-03-02.pdf>, p. 81.

to mechanize, and these conflicts took place within their technological systems of mechanized grain farming.

The augmentation of labor productivity that machines made possible was significant. One cradler, followed by two binders, could reap two to four acres of grain in a normal day. A mechanical reaper with only an extra hand or two could make it through twelve to fifteen acres in the same time.¹⁵⁷ Mechanical threshers, meanwhile, allowed hundreds of bushels of grain to be threshed in a single day.¹⁵⁸ The relationship of sewing machines to the productivity of home sewing is less clear, though the time necessary for sewing tasks was likely less with a machine than by hand.¹⁵⁹ Washing machines could also decrease the time necessary for that task. One advertisement for a washing machine boasted that “one lady says she did a washing for a family of twelve in two hours, and did not feel tired.”¹⁶⁰ Machines thus allowed farmers to begin maximizing production on their farm.

The family itself was the principal system for organizing farm labor. Farming families produced systems of mechanized grain agriculture by fitting machines into their methods of organizing family labor. Yet there were some conflicts within farming families about mechanization as well, particularly as farm women asserted the importance of the mechanization of the household alongside the mechanization of the

¹⁵⁷ Rogin, 128-136.

¹⁵⁸ Rogin, 185-186.

¹⁵⁹ Connolly, 112-117; See also Cowan, *More Work For Mother*, which argues that household machines did not reduce time spent working on household labor, albeit in a mostly twentieth-century context.

¹⁶⁰ “The Calkins Champion Washer.” *Ladies’ Own Magazine*. May 1872, 234.

fields as essential to the production of modern grain farming. These conflicts were conditioned by and occurred within systems of family labor organization.

Machines entered a social system of labor management involving men, women, and children. For much of the year, the ordinary farming family provided the majority of the labor for planting, cultivating, and harvesting crops as well as for the myriad other tasks involved in maintaining a farm home. The wheat harvest was labor-intensive and had to be done in a narrow window of time when the crop was ready—this reality is a larger part of the reason that wheat harvesting was mechanized earlier than the harvesting of other crops. Farm families rushed to get wheat in before it became overripe or spoiled. The men and boys of the family were most often involved in the cutting of the grain as well as the processes of stacking, drying, and threshing. Cutting by hand with a sickle or a cradle could be long, hard work. Though men did most of the field work, women and children participated as well: the gendered division of labor was permeable.¹⁶¹ Women harvested grain with scythes and cradles most often when men were not around or were

¹⁶¹ On the place of boys and girls in farm labor, see, Pamela Riney-Kehrberg, *Childhood on the Farm: Work, Play, and Coming of Age in the Midwest* (Lawrence: University of Kansas Press, 2005), 10-60. For discussions of the ideologies and social relations of the “separate spheres” in the North, see, Kelley, *In the New England Fashion*; Jeanne Boydston, *Home and Work*; Jensen, *Loosening the Bonds*; Osterud, *Bonds of Community*. Both Jensen and Osterud point to the permeability of the division between men’s and women’s labor on the farm; Schwieder, “Labor and Economic Roles of Iowa Farm Wives, 1840-1880,” 152–74, argues that Midwestern wheat farms in plains states were characterized by a particularly stark gendered division of labor. For more discussions of the real, but permeable, divisions of labor between Midwestern men and women on the farm, see, Riley, *Frontierswomen*; Glenda Riley, “‘Not Gainfully Employed’: Women on the Iowa Frontier, 1833-1870.”; Patterson-Black, “Women Homesteaders on the Great Plains Frontier.”; Fink, “Mom, It’s a Losing Proposition.” For similar discussions of farm women in Canada, see, Linda Rasmussen et al., eds., *A Harvest Yet to Reap*.

unable to help.¹⁶² They seem to have assisted in threshing by flail more frequently.¹⁶³

Some manufacturers, like those of the Emery Seed Planter, advertised machines as light enough to be used by women or children—who sometimes sowed by hand as well.¹⁶⁴ The relationships between people and machines were forged by all members of the family.

Farm families continued to rely on their own systems of internal labor organization when using machines. Boys were more likely to spend their days helping fathers in the fields, and girls were more likely to help their mothers with an array of tasks that were not limited to the household. This division was often even less stark among children than it was among adults. Young girls did some outdoor work, and boys helped with domestic tasks. When reaping, children might be assigned tasks peripheral to the machines themselves, such as binding, shocking, or stacking.¹⁶⁵ Other peripheral tasks included bringing water to the adults who were working with the machine.¹⁶⁶ Girls were also called upon to perform these peripheral tasks, though perhaps less frequently than their brothers.¹⁶⁷ Farming families thus found roles in the machine harvest process that fit the capabilities of children, and children themselves performed that labor.

¹⁶² Rebecca Burlend and Edward Burlend, *A True Picture of Emigration*, ed. Milo Milton Quaipe (Chicago: Lakeside Press, 1936), 91-92; William J. Healy, *Women of Red River: Being a Book Written from the Recollections of Women Surviving from the Red River Era* (Winnipeg: Women's Canadian Club, 1923), 97, 110, 119; George Allen, "Diaries," July 26, 1875.

¹⁶³ William Cooper Howells, *Recollections of Life in Ohio from 1813 to 1840* (Cincinnati: Robert Clarke, 1895), 155-156.

¹⁶⁴ "Emery's Albany Seed Planter." *Prairie Farmer*, September 1848, 275.

¹⁶⁵ Riney-Kehrberg, 37-51; Bartholomew Elam, "Diaries," (1871-1934), June 21, 1871, MS 1069-1074, Bartholomew Elam Diaries, 1871-1934, Kansas State Archives; Elam, "Diaries," June 26, 1871; Elam, "Diaries," July 15, 1875.

¹⁶⁶ Frank T. Clappitt, *Some Incidents in My Life: A Saga of the "Unknown" Citizen* (Ann Arbor, MI: Edwards brothers, 1936), 32-33, recalls bringing water to the men harvesting by machine in his childhood.

¹⁶⁷ Matilda Peitzke Paul, "The Memoirs of Matilda Peitzke Paul," ed. Glenda Riley, *Palimpsest* 57, no. 2 (1976), 58; Riley, *Frontierswomen*, 84.

Among adults, it remained the case that the men of the family continued to do most of the harvest work, even with labor-saving machines, but the gendered division also remained permeable. Farm women sometimes harvested with either hand implements or reapers when the men of their families were unable to help.¹⁶⁸ Mary Livermore described Midwestern farm women driving reapers during the harvest while many of the local men were away during the Civil War. Livermore at first “turned away in aversion” at this violation of the separate spheres, but upon second thought she “observed how skillfully they drove the horses round and round the wheat-field.” She also praised the “precision and nicety” with which the binders following the machines did their work. While the dearth of men during the war was temporary, these boundaries remained permeable especially when necessity demanded. All members of farm families actively applied their knowledge and skill to the task of making a place for machines in their family labor systems.¹⁶⁹

Even when women did not actively work with machines, their labor was still an essential part of machine-use practices. Threshing was one of the most labor-intensive jobs on a Midwestern wheat farm, both before and after the introduction of machines, and the operation of threshing machines required the presence of many workers at once,

¹⁶⁸ Calvin Fletcher, *The Diary of Calvin Fletcher*, ed. Gayle Thornbrough, Dorothy L. Riker, and Paula Corpuz, vol. 9, 1865–1866 (Indianapolis: Indiana Historical Society, 1983), August 8, 1865, 133; Rebecca Burlend and Edward Burlend, *A True Picture of Emigration*, ed. Milo Milton Quaife (Chicago: Lakeside Press, 1936), 91-92; Kate Stephens, *Life at Laurel Town in Anglo-Saxon Kansas* (Lawrence: Alumni Association, University of Kansas, 1920), 25.

¹⁶⁹ Mary Livermore, *My Story of the War* (Hartford, CT: Worthington and Company, 1889), 144-146. This anecdote was originally published as, “Western Scenes,” in United States Sanitary Commission Report, vol. 1. no. 12, April 15, 1865.

whether they were hired hands or neighbors. Women took on the task of cooking what Iowa farmer Marion Richardson Drury described as the “festival-like meals” that accompanied threshing. They also might have extra work to do boarding or even washing for these men.¹⁷⁰ Farm women also cooked for hired men and neighbors who came to assist in other parts of the harvest process such as cutting the grain with mechanical reapers.¹⁷¹ Farm men, women, and children thus all participated in the use of harvest machines within systems of family labor.

There were gendered conflicts within farm families about how to produce mechanized systems within the household. These conflicts often revolved around the question of which machines to prioritize. Rural women contested the disparity between the enthusiasm their husbands displayed for field machines over those that lightened women’s labors. *Godey’s Lady’s Book* ran a short story titled, “Mr. Jones’s Secret,” in 1874 that highlighted this tension. In the story, a farmer named Jones purchased a washing machine for his wife that he later declared a “humbug” and discarded. Jones thereafter developed a skepticism for all such machines. A local woman sought to correct

¹⁷⁰ Marion Richardson Drury, *Reminiscences of Early Days in Iowa* (Toledo, OH: Toledo Chronicle Press, 1931), 49; Isely and Isely, 189-190; Howard Ruede, *Sod-House Days: Letters from a Kansas Homesteader, 1877-78*, ed. John Ise (New York: Columbia University Press, 1966), 119, 136-137; Luna Kellie, *A Prairie Populist: The Memoirs of Luna Kellie*, ed. Jane Taylor Nelsen (Iowa City: University of Iowa Press, 1992), 85; Harcourt Horn, *An English Colony in Iowa* (Boston: Christopher Publishing House, 1931); See also, J. Sanford Rikoon, “From Flail to Combine: Folk Culture and Technological Change in the Rural Midwest” (Bloomington, Indiana University, 1986), 124-127; Rikoon, *Threshing in the Midwest*, 49, 119-123; Evanda Cochrane Burba, “B. J. Cochrane, Dakota Pioneer, 1849-1949,” in *South Dakota Historical Collections*, vol. 34 (Pierre: State Publishing Co., 1968), 398, 417; Laura Ingalls Wilder, *Little House in the Big Woods* (New York: Harper Collins, 1932), 226-228.

¹⁷¹ Ann M. Brackett, “Journals, Volume Three” (July 3, 1870-January 1, 1875), August 30, 1870, p. 7, Ann M. Brackett journals, William L. Clements Library, University of Michigan; Brackett, “Journals, Volume Three,” August 2, 1873, p. 206.

his prejudice: “you are deluding yourself that there isn’t any articles good for anything for the household, while there are lots of very excellent machines for out of doors.” The story resolves with Jones conceding and purchasing household machines, including a washer and wringer, for his wife.¹⁷² *Godey’s* thus fictionalized a conflict that may have been happening within many farm families and provided a resolution in which women succeeded in convincing men to take their contributions to the mechanization of the farm seriously.

Nevertheless, farm men held most of the decision-making power when it came to purchasing machinery, and they thus determined where mechanization made sense within their family labor systems. While sewing machine companies had to combat some skepticism of women’s ability to use machines in their advertisements and marketing strategies, farming families’ disinterest in sewing machines grew from their minimal influence on cash income production.¹⁷³ Because sewing machines did not contribute directly to the production of new income like field machines did, farm families often considered them more of a luxury than a productive contribution to family labor.¹⁷⁴ Elise Dubach Isely remarked on that consideration when she described the \$60 paid for a sewing machine as “a large sum to pay for a machine which accomplished nothing but the lightening of woman’s toil.” Isely’s family did purchase one, however, thanks to an unusually good crop the year before.¹⁷⁵ Laura Ingalls Wilder wrote of her parents having

¹⁷² “Mr. Jones’s Secret.” *Godey’s Lady’s Book*. December 1874, vol. 89, pg. 524-531.

¹⁷³ Brandon, 70, 122-125; Fite, 46.

¹⁷⁴ Connolly, 66-70.

¹⁷⁵ Elise Dubach Isely and Bliss Isely, *Sunbonnet Days* (Caldwell, ID: Caxton Printers, 1935), 218.

similar thoughts regarding sewing machines as being “foolish to buy one only for family sewing,” despite the time and labor it would save, due to similar concerns about an expensive machine that, unlike a mechanical reaper, would not pay for itself in new income.¹⁷⁶ Nevertheless, even the Ingalls ended up purchasing a sewing machine a few years later as well.¹⁷⁷ While field machines were given general preference in the context of family labor conflicts, the mechanization of the household continued as well.

When farm families did purchase sewing or washing machines, women incorporated machine work into their family labor systems and men sometimes involved themselves in those systems in new ways. Farm women and girls remained the primary sewers even with the use of machines.¹⁷⁸ Girls as young as nine years old used sewing machines.¹⁷⁹ The gendered division of labor was again permeable, however, as some men used sewing machines and also assisted in setting up and repairing them.¹⁸⁰ Lorenzo Dow Brown of Indiana, for instance, took an immediate interest in the sewing machine his family purchased in 1871 and began to sew alongside his wife—an activity he does not seem to have done before the arrival of the machine.¹⁸¹ He began to do much of the

¹⁷⁶ Laura Ingalls Wilder, *Little Town on the Prairie* (New York: Harper Collins, 1941), 36.

¹⁷⁷ Laura Ingalls Wilder, *These Happy Golden Years* (New York: Harper Collins, 1943), 241-243.

¹⁷⁸ Connolly, 50-150; On girls using sewing machines, see, Connolly, 108. For a discussion of machine sewing as gendered labor, see, Gordon, *Make It Yourself*.

¹⁷⁹ Correspondence. *Grange Advance*, April 1, 1874. Minnesota Historical Society, Digital Newspaper Hub. <https://newspapers.mnhs.org/jsp/PsBrowse.jsp>.

¹⁸⁰ Ferguson, “Diary,” June 3, 1873; Ellen Mahaffrey, “Diary” (1873), May 4, 1873, M 0404, Box 3, Folder 3, Ione Swan Paugh Collection, 1872-1971, Indiana Historical Society.

¹⁸¹ Lorenzo Dow Brown, “Journal Transcriptions” (1871), August 12, 1871, M 0789, Box 3, Folder 10, p. 49. Lorenzo Dow Brown Journals and Transcriptions, 1859-2001. Indiana Historical Society; Lorenzo Dow Brown, “Journal Transcriptions,” November 9, 1871, Box 3, Folder 10, p. 70; Lorenzo Dow Brown, “Journal Transcriptions,” January 27, 1875, Box 4, Folder 1, p. 8.

family's sewing, and even participated in some group sewing on the machine with visiting neighbors.¹⁸² Brown had been a machine-minded farmer for decades prior. He did repairs on harvest machines for neighbors and even applied for several patents. But his enthusiastic use of the sewing machine allowed him to craft a new space for himself between men's and women's work, even as his wife continued to sew as well. The incorporation of machines into family labor systems thus opened up new spaces for the renegotiation of the gendered boundaries within those systems as farming people produced mechanized households.

Women also had to make their labor with sewing machines compatible with their other household labors, including childcare. Rachel Bowman Cormany brought her year-old daughter with her when travelling to help family members with their sewing.¹⁸³ One mother wrote to *Godey's Lady's Book* that she "sewed hours with a baby in my lap" as a testimonial for a particular machine.¹⁸⁴ Similar concerns might have motivated some women to seek out machines that ran with less noise than others.¹⁸⁵ While the farm woman did not build the sewing machine that she ran with a baby on her lap, it was farm

¹⁸² Lorenzo Dow Brown, "Journal Transcriptions," August 12, 1871, Box 3, Folder 10, p. 49; Lorenzo Dow Brown, "Journal Transcriptions," November 9, 1871, Box 3, Folder 10, p. 70; Lorenzo Dow Brown, "Journal Transcriptions," January 18, 1872, Box 3, Folder 11, p. 6; Lorenzo Dow Brown, "Journal Transcriptions," February 6, 1872, Box 3, Folder 11, p. 11; Lorenzo Dow Brown, "Journal Transcriptions," February 7, 1872, Box 3, Folder 11, p. 11; Lorenzo Dow Brown, "Journal Transcriptions," January 27, 1875, Box 4, Folder 1, p. 8; Lorenzo Dow Brown, "Journal Transcriptions," February 9, 1876, Box 4, Folder 2, p. 13; Hattie Moore visited to work on the machine in 1876. Lorenzo Dow Brown, "Journal Transcriptions," June 5, 1876, Box 4, Folder 2, p. 47.

¹⁸³ Cormany, August 29, 1864, p. 448.

¹⁸⁴ Mrs. M. L. Peck. *Godey's Lady's Book*, March 1870, vol. 80, 293; "Our Arm Chair-Wheeler and Wilson." *Peterson's*, March 1870, 244, repeats the claim and also attributes it to a Mrs. L. M. Peck.

¹⁸⁵ "Whir! Whir! Whir!" *Prairie Farmer*, June 15, 1867, 403.

women who developed the knowledge and practices necessary to use machines while maintaining their household at the same time. Additionally, they could not use machines for some fabric-making and fabric-mending tasks. Canadian farm woman Nell Wilson Parsons recalled that her mother had insisted she learn to sew by hand even though they had a machine because there were some important sewing tasks that could not be done by machine, such as fine needlework and quilting.¹⁸⁶ As farm women adjusted their machine sewing practices to fit with their labors, they contributed to the production of the mechanized farm.

The gendered character of family labor systems became embedded in the use of machines, but farming people set the parameters of their own machine use. The adaptation of machine use to practices of family labor was an essential component of widespread mechanization. Farming families—through adaptation, conflict, and knowledge—produced systems of mechanized farming within their systems of family labor.

Community Labor Systems

It was rare that a farm family could accomplish all of its necessary work with the labor of the immediate family alone. Neither was it likely that a single farm family would

¹⁸⁶ Nell Wilson Parsons, *Upon a Sagebrush Harp* (Saskatoon: Prairie Books, 1969); See also, Connolly, 102.

own all of the machinery they might use in the course of a year.¹⁸⁷ Farm families sought help from outside the family by hiring wage workers and by relying on kinship networks and their local communities to “change works.” Changing works involved splitting time and labor reciprocally at one another’s farms. By fitting machines into systems of local and informal cooperation, farming people produced systems of industrial agriculture out of both machines and their local relationships.

Due to the time-sensitive and labor-intensive nature of the grain harvest, the summer months were a time when the labor of external family and neighbors was especially necessary. When farm families used cradles or sickles, they relied on having multiple people cutting, stacking, and binding grain.¹⁸⁸ While farmers sometimes cut wheat with little help, they seemed to have preferred to have multiple cradlers cutting at one, with a pair of binders following after each. The need for binders and stackers remained with machine harvesting. Farmers thus often worked on one another’s fields and with one another’s machines, or they might, as Ontario farmer William Coleman did in 1861, send a family member in their place to fulfill the obligation.¹⁸⁹ By sharing machines, more farmers participated in the industrialization of agriculture than those who

¹⁸⁷ Fite, 44, has found that most farmers in Pope county, Minnesota, owned fewer than \$100 worth of machinery in 1870 and extrapolates these findings to the upper Midwest and central prairie regions generally.

¹⁸⁸ Howells, 62-64.

¹⁸⁹ William R Coleman, “William R. Coleman Diary” (1865-1915), January 10, 1873, William R. Coleman Collection, Simcoe County Archives, Accessed via Rural Diary Archive. <https://ruraldiaries.lib.uoguelph.ca/transcribe/files/show/9016>.

could afford a machine themselves. They could also only pursue mechanization as fast as was necessary in the context of their farm systems of labor organization.

While the number of workers necessary for a farmer to bring to his fields during the harvest decreased when using machines, there was an extra component added to the reciprocal relationships: the machine itself. Farmers would loan one another their non-machine implements like cradles, sickles, and plows.¹⁹⁰ Yet the expense of machines behooved even more farmers to make their first use of machines on their fields come not after the purchase of their own, but upon securing the use of a neighbor's.¹⁹¹ Kansas farmer August Thatcher Daniels even loaned his reaper to a neighbor in the morning and ran it on his own field later that day.¹⁹² Farmers also relied on family labor in their practices of working with, and for, neighbors, as they brought not only their machines, but also their sons to harvest for neighbors.¹⁹³ When farmers sought to harvest their own

¹⁹⁰ William R. Brown, "Diary, March 12-June 14 1846" (March 12-June 14, 1846), June 3, 1846, M 93, Microfilm Reel 1, William R. Brown and family papers, Minnesota Historical Society; Lorenzo Dow Brown, "Journal Transcriptions" (June 4, 1872), Box 3, Folder 11, p. 40; Lorenzo Dow Brown, "Journal Transcriptions", September 6, 1873, Box 3, Folder 12, p. 56; Rebecca Burlend and Edward Burlend, *A True Picture of Emigration*, ed. Milo Milton Quaife (Chicago: Lakeside Press, 1936), 89, 123; John Campbell Bailey, "Diary" (1867), March 1, 1867, p. 7, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum.

¹⁹¹ See also, Charles W. Woodbury, Martha E. Woodbury, and Martha A. Woodbury, "Diary" (August 1854-June 1885), August 1854, p. 176, 192, 194, 253, P2028, Box 1, Woodbury family diaries, Minnesota Historical Society; Henry A. Griswold, "Diary, January 9, 1858-December 31, 1861" (1858-1861), July 18, 1861, p. 127, MS-BC260, Box 1, Henry A. Griswold papers, Abraham Lincoln Presidential Library and Museum. Henry A. Griswold, "Diary, January 1862-December 1871" (1862-1871), p. 12, 60, 87, 107, 180, 202, MS-BC260, Box 1, Henry A. Griswold papers, Abraham Lincoln Presidential Library and Museum, Griswold shared machines and did machine work for many neighbors throughout the years documented in this diary; Irvin W. Rollins, "Diaries" (1848-1879), August 5, 1861, M 701, Reel 2, Irvin W. Rollins papers, Minnesota Historical Society.

¹⁹² August Thatcher Daniels, "Diary" (1865-1921), July 13, 1865, MS 924, August Thatcher Daniels Diary, Kansas State Archives.

¹⁹³ Woodbury, Woodbury, and Woodbury, "Diary," p. 131.

wheat, they travelled to multiple neighbors farms to ask after one.¹⁹⁴ Other machines, like mowers, might instead be shared throughout the year.¹⁹⁵

Farmers reciprocated within systems of mutual obligation that now included machines in a number of ways. Sometimes a farmer who bought a machine shared it with others in his area in exchange for the labor they often provided for him. John Turner, for instance, paid back the two brothers who took around a harvesting machine in the 1870s, by stacking the cut grain for them on other farms as well. Turner recorded that he never received cash in these exchanges, but instead exchanged work for work.¹⁹⁶ Minnesota farmer, Andrew Peterson, repaid the man who supplied oats to the horses who powered the threshing machine in 1858 with one day's labor.¹⁹⁷ Even wealthier farmers like Calvin Fletcher, who owned multiple farms and rented fields to others, also shared machines. In the 1850s, Fletcher shared his machines with another farmer.¹⁹⁸ Later, in 1863, he made use of a different farmer's reaper and mower.¹⁹⁹ Farmers made machines a part of their reciprocal practices of labor exchange that only they could manage.

¹⁹⁴ Brackett, "Journals, Volume One," August 19, 1865, p. 118.

¹⁹⁵ Bailey, "Diary" (1867), July 22, 1867, p. 22.

¹⁹⁶ John Turner, *Pioneers of the West: A True Narrative* (New York: Eaton and Maris, 1903), 157, 221.

¹⁹⁷ Andrew Peterson, "Diary Translation," trans. Emma Margareta Ahlquist (1855-1898), October 26, 1858, M 231, Andrew Peterson and Family Papers, 1850-2007, Minnesota Historical Society. Microfilm 231, reel 2, pg. 55.

¹⁹⁸ Calvin Fletcher, *The Diary of Calvin Fletcher*, ed. Gayle Thornbrough, Dorothy L. Riker, and Paula Corpuz, vol. 5, 1853-1856 (Indianapolis: Indiana Historical Society, 1977), July 2, 1853, 89.

¹⁹⁹ Calvin Fletcher, *The Diary of Calvin Fletcher*, ed. Gayle Thornbrough, Dorothy L. Riker, and Paula Corpuz, vol. 7, 1861-1862 (Indianapolis: Indiana Historical Society, 1980), June 8, 1863, 153.

Machine sharing might go beyond using another's machine into outright joint ownership. Some farmers purchased machines together.²⁰⁰ Farmers C. W. and W. W. Marsh, who would go on to become inventors and manufacturers in the harvester industry, purchased their first reaper "in connection with a neighbor" in 1855.²⁰¹ Agricultural newspapers recommended sharing machines as a responsible practice. One article in the *Prairie Farmer* about "immigrating to the west" in 1848 told farmers not to worry about preparing a threshing operation "where threshing machines are aplenty."²⁰² The *Canadian Agriculturalist* also recommended that most farmers only purchase a threshing machine if they could share the cost with a neighbor.²⁰³ The committee for a reaper and mower trial in 1852 recommended "that where a farmer does not feel able to buy both a Reaping and a Mowing machine, that he should unite with a neighbor and buy a Reaper and the other a Mower."²⁰⁴ The addition of machines to the usual processes of reciprocal exchange shows how machines both fit in to the social means of procuring labor, but also how they began to reshape them. Machines became some of the important things to be shared, alongside time and labor. Practices of machine sharing also allowed

²⁰⁰ For examples of other Midwestern farmers sharing the ownership and cost of machines, see, Lorenzo Dow Brown, "Journal Transcriptions," August 23, 1860, Box 3, Folder 2, p. 25-26; Edward Hawkes, "The Diaries of a Nebraska Farmer, 1876-1877," ed. Clarence Paine, *Agricultural History* 22, no. 1 (1948): 1-31; B. Elmendorf to William D. Guernsey and N. B. Lovering, November 10, 1862, Box 1, Folder 68, Guernsey Family Papers, Huntington Library, San Marino, California; See also Olmstead and Rhode, "Beyond the Threshold."

²⁰¹ Charles W. Marsh, *Recollections, 1867-1910* (Chicago: Farm Implements News Company, 1910), 80.

²⁰² James Plocker. "Immigrating to the West." *Prairie Farmer*, August 1848, 259.

²⁰³ "Threshing Machines." *Canadian Agriculturalist*, September 1850, 199.

²⁰⁴ *Ohio Statesman*, July 13, 1852.

farming people to purchase new machines only as far as made sense in the context of their systems of labor organization.

As farming people shared machines and machine work, they negotiated the new tasks of mechanized systems of shared labor. Some farmers who owned reapers, like Samson Howell of Ontario, seem to have preferred driving their own reapers when on their own or others' farms.²⁰⁵ In other instances, the farmer whose crops were being cut might perform more of a supervising role and directed the operation from aside.²⁰⁶

Another Ontario farmer, John Ferguson, remarked on how his task while reaping on another's farm was not driving the reaper but instead "pulling off the sheaves from the reaper which I have done pretty much all harvest."²⁰⁷ Other farmers and workers settled into roles further removed from the machine itself. In the mid-1870s, John Turner went around with a pair of brothers and their harvesting machine. Turner considered himself a good binder and stacker and performed those tasks at a number of farms during the harvest season. In return, the Myers brothers cut his grain. While Turner was proud of his skill at binding and stacking, he never took a role that involved operating the machine directly.²⁰⁸ Other farmers and workers might switch off tasks, however, and thus each

²⁰⁵ Samson Howell, "Samson Howell Diary," (1868-1869), August 4, 1868, Samson Howell Diary Collection. Archival and Special Collections, University of Guelph, Accessed via Rural Diary Archive; Samson Howell, "Diary, 1868-1869" (August 5, 1868).

²⁰⁶ Peterson, "Diary and Translation" August 5, 1871, Reel 2, p. 246.

²⁰⁷ John Ferguson, "John Ferguson 1869 Diary Transcripts" (1869), July 3, 1869, John Ferguson Diary Collection, Peel Art Gallery, Museum and Archives and Archives of Ontario. Rural Diary Archive. <https://ruraldiaries.lib.uoguelph.ca/transcribe/collections/show/3>; Rogin, 96-101, shows that raking, or pulling off sheaves, would be eliminated on some farms by the use of self-binding reapers in the 1860s and 1870s, but it remained a part of machine harvesting on others.

²⁰⁸ Turner, 157, 221-222, 284-285, 330.

participant would drive the machine sometimes, and perform peripheral tasks at other times.²⁰⁹ Whichever role a particular harvester filled, they contributed to the production of industrial agriculture out of shared labor.

Farming people had to maintain the relationships between different farms and machines across distances. Threshing machines were commonly moved from one farm to another when they were needed, but not without difficulty.²¹⁰ In other cases, it was the responsibility of each farmer to bring their bags full of grain to the machine.²¹¹ Even when a machine was available and ready for use, farming people relied also on the willingness of neighbors and kin to loan their animals to power the machines.²¹² Either method involved farmer efforts to maintain relationships with one another and to transport machines.

Year-round work, especially women's sewing and washing work, was also part of reciprocal labor systems; farm women made household machines work with these systems. Women helped one another with washing and sewing.²¹³ Women especially

²⁰⁹ Nimrod Barrick, "Diary" (1871-1932), August 7, 1872, M421, Reel 1, Barrick and Kennedy family papers, Minnesota Historical Society; Barrick, "Diary," August 17, 1873.

²¹⁰ Coleman, "Diary," March 21, 1871; Calvin Fletcher, *The Diary of Calvin Fletcher*, ed. Gayle Thornbrough, Dorothy L. Riker, and Paula Corpuz, vol. 8, 1863–1864 (Indianapolis: Indiana Historical Society, 1981), July 24, 1863, 181; Peterson, "Diary Translation," November 9, 1865, Reel 2, pg. 120-121. See also Chapter 2 of this dissertation.

²¹¹ Ruede, 120-121.

²¹² Anson W. Buttles, "Diaries" (1856-1906), October 4, 1869, Reel 2, Micro 2068, Anson W. Buttles Papers, Wisconsin Historical Society; Buttles, August 11, 1870, Reel 2, also shows an example of farmers sharing horses for use with harvesters; Ann M. Brackett, "Journals, Volume One" (August 28, 1863-October 17, 1865), "Journals, Volume One," October 10, 1864, p. 69, Ann M. Brackett journals, William L. Clements Library, University of Michigan; Brackett, "Journals, Volume Three," September 4, 1873, p. 213.

²¹³ James W. Witham, *Fifty Years on the Firing Line: My Part in the Farmers' Movement by "The Cornfield Philosopher"* (Published by the Author, 1924), 1; Ellen Strang, "Diary of a Young Girl," ed.

shared large sewing tasks at gatherings sometimes called “sewing bees.”²¹⁴ These shared sewing tasks were a place of women’s community that continued with the adoption of machine sewing.²¹⁵ While the early boosters of sewing machines, including Louis Godey, considered the possibility of different families sharing machines, sewing machines were not portable enough to regularly cart around from house to house.²¹⁶ Still, some women did bring machines with them to the houses of neighbors and family to assist with sewing. Rachel Bowman Cormany visited other women to help with the demands of sewing projects at the turn of seasons.²¹⁷ In August 1864, she rode in her brother-in-law’s carriage to his house to help with sewing and brought her machine along with her. Had the carriage not been available, she likely would not have been able to bring the machine with her and she seems to have helped on other occasions without bringing the machine.²¹⁸ Other women visited one another to sew with machines.²¹⁹ Women could also send fabrics out with family or friends to sew on their own machines, as a young

Lida L. Green, *Annals of Iowa* 36, no. 6 (Spring 1964): 452-455; See also, Woodbury, Woodbury, and Woodbury, “Diary,” 123.

²¹⁴ Mary Ann Ferrin, “An Autobiography and a Reminiscence,” *Annals of Iowa* 37, no. 4 (Spring 1964): 242.

²¹⁵ For a consideration of how machine sewing changed the communal nature of shared sewing work, see, Connolly, 100.

²¹⁶ Brandon, 117.

²¹⁷ Rachel Bowman Cormany, (May 23, 1863), James C. Mohr, ed., *The Cormany Diaries: A Northern Family in the Civil War* (Pittsburgh: University of Pittsburgh Press, 1982), pg. 291; Cormany, (April 13, 1864), pg. 441.

²¹⁸ Cormany, August 29, 1864, p. 448.

²¹⁹ Lorenzo Dow Brown, “Journal Transcriptions,” June 3, 1876, Box 4, Folder 2, p. 47; John A. Michie, “Self Doing Naught” (1869-1899), July 3, 1869, John Albert Michie Diary Collection, University of Guelph Archives and Special Collections, Accessed via Rural Diary Archives. <https://ruraldiaries.lib.uoguelph.ca/transcribe/collections/show/91>; Jacob Rumbaugh, *Reminiscences of Jacob Rumbaugh* (Kansas City: Franklin Hudson, 1910), 55; Isely and Isely, 217; Julia Hand, “Diary” (1872-1875), January 1, 1875, MS 733.05, Julia Hand Diary, Kansas State Archives.

Kansas woman named Abbie Bright did in 1871.²²⁰ John Campbell Bailey recorded not only that others visited his house to use, but also to share and transport a sewing machine.²²¹ Farm families found ways to continue to share their resources to accomplish domestic tasks by machine and thus produced a mechanized farm household alongside mechanized fields.

Visiting with one another in order to share sewing machines and sewing machine work was one of the ways in which farm women cultivated machine knowledge. To be certain, many would have learned something about machines from newspapers or any instructions that accompanied the machine upon purchase. But many others would have learned how to run a sewing machine before having one of their own. One woman claimed in a testimonial that that she had instructed seven people in the workings of the machine herself.²²² As farm women produced mechanized households, they also shared machine knowledge with one another.

Rural communities fit new machines into their practices of sharing work. They also changed those practices by making a place in them to share not only work with machines, but also the machines themselves. In doing so, they produced new technological systems that were built of more than just machines and fields, but of social relationships as well. These new technological systems also only relied on machines to

²²⁰ Abbie Bright, "Roughing It on Her Kansas Claim: The Diary of Abbie Bright, 1870-1871-Concluded," ed. Joseph W. Snell 37, no. 4 (Winter 1971): 420.

²²¹ John Campbell Bailey, "Diary" (1873), July 2-3, 1873, p. 38; Bailey, "Diary" (1873), August 9, 1873, p. 41.

²²² Mrs. M. L. Peck. *Godey's Lady's Book*, March 1870, vol. 80, 293; "Our Arm Chair-Wheeler and Wilson." *Peterson's*, March 1870, 244.

the extent that those machines worked within and augmented their systems of labor organization.

Wage Labor Systems

Farmers also fit machines into a more typically capitalist method of labor organization: the hiring of farm workers for wages. They crafted their practices of machine use to the social contexts of their systems of organizing labor. They hired workers to do machine work and paid cash for the use of machines. Both farmers and their hired workers thus brought machines into another farm system. Technological systems of grain farming were thus constructed in the context of labor relations. Farmers used machines, or passed on machines, in ways that were conditioned by their relationships with hired labor. They did so, however, in the midst of some conflict within farming communities between employing farmers and the hired hands they paid for machine work. Overall, however, both farmers and hired workers—as well as those who occupied both positions at different times—contributed to the production of industrial agriculture by making machines work within their labor systems.

Many farmers were already used to paying wages for farm work.²²³ Farmers paid hired hands, and one another, for their work on and around machines in the harvest. Some hired workers were family members of other farmers in the area. Others were aspiring

²²³ Howells, 62; Ann M. Brackett, “Journals, Volume One” August 10, 1864, p. 60.

proprietors new to the area who were still setting up their farms.²²⁴ Young women also could earn a wage assisting with women's tasks. Emily Hawley Gillespie of Iowa, for instance, did sewing work for pay and stayed as a hired girl with another family before her marriage.²²⁵ Other tasks of hired girls included the preparing of meals for a threshing crew when that machine was brought to the farm.²²⁶ Both employers and hired workers had to fit machines into these labor systems.

Yet hired workers sometimes resisted machinery. There were some scattered instances where laborers refused to work with new harvesting machines in the Midwest.²²⁷ Even some contributors to the agricultural press expressed concern about the effects of mechanization on labor. Notable rural writer Solon Robinson actually recommended against the use of threshers in his popular *Facts for Farmers*. He believed that it was better for both farmers and hired hands if the hands were employed year-round rather than only in the harvest season. Robinson argued that, because "thrashing is the only winter employment the farm can give hirelings," farmers should allow the process to be drawn out over the winter months.²²⁸ Unsurprisingly, most farmers in the 1860s and 1870s did not follow Robinson's advice as machine threshing superseded older

²²⁴ See, for instance, Ruede, 93; Peter Norbeck and George Norbeck, *The Norbecks of South Dakota* (Redfield, SD: George Norbeck, 1938), 92-93; Cyrus Morton, *Autobiography of Cyrus Morton* (Omaha: Douglas Printing Co., 1963), 11.

²²⁵ Emily Hawley Gillespie and Judy Nolte Lensink, *A Secret to Be Buried: The Diary and Life of Emily Hawley Gillespie* (Iowa City: University of Iowa Press, 1989), 40, 46-47.

²²⁶ Bruce Bliven, "A Prairie Boyhood," *Palimpsest* 49, no. 8 (August 1968): 326.

²²⁷ For instances of hired harvest workers refusing to work with reapers, as well as for farmers and agricultural newspapers casting machines as a check against the demands of hired workers, see Schob, 87-90, 107. For a discussion of hired workers resistance to reapers in Virginia, see, Rood, *The Reinvention of Atlantic Slavery*, 176, 183.

²²⁸ Solon Robinson, *Facts for Farmers* (New York: A. J. Johnson, 1867), 682.

methods.²²⁹ However, J. Sanford Rikoon argues that hired workers resisted mechanized threshing less than mechanized harvesting because the use of threshing machines fit with other social practices.²³⁰

Some farmers, and especially members of the agricultural press, defended the machines against workers' resistance. E. Nichols wrote to the *Ohio Cultivator*:

Some laboring men are opposed to machines. Fools they are! Since the introduction of machinery, laboring men have what kings had not before. Laboring men who oppose machinery act as unwisely as those who burn wheat stacks in time of scarcity, to make bread plenty. The greatest amount of labor that can be done with the smallest number of hands, will give the greatest product to be divided between employer and employed. Why! If machinery hurts labor, then we should go back, and be the lowest of savages; savages alone live without machinery, and even these have a few rude implements, and their condition is indicated by the machinery they use!²³¹

While the farm press was quick to argue that machinery helped hired workers, David Schob argues that advocates of progressive or scientific farming saw machines as a way for farmers to protect themselves from the wage demands of hired workers.²³²

Farmers used machines as leverage in extant conflicts within hired labor systems. These conflicts marred the production of industrial farming within rural communities but did not halt it.

The demand for machines was less pronounced in regions where robust systems of hired labor and large populations of potential farm workers were present. The farmers of New England communities were more likely to reject the first machines demonstrated

²²⁹ Rogin, 172.

²³⁰ Rikoon, *Threshing in the Midwest*, 51.

²³¹ "Mowing Machine." *Ohio Cultivator*, September 1, 1847, 123.

²³² Schob, 90.

to them. They likely had easier access to either hired or shared labor than farmers in less populated areas further west.²³³ This was also the case in the Ohio River Valley, where a larger population of black farmers and farm workers lived. Some white farmers in the region saw this situation in racialized terms. A farmer from Southern Ohio wrote, “We have a colored man who can cut 8 acres of wheat per day; so you see we have but little need of your patent reapers; but if you have any that can beat ours, we would like to hear from them.”²³⁴ White farmers in the Ohio river valley were more able to command labor than farmers in other areas. Hired black labor extended into the farm home as well. In the later 1850s, the editor of the *Ohio Cultivator* wrote, “The only washing machine that stands the test with us, is a strong *yaller gal*, who comes once a week, and goes through the old-fashioned manual over a tub and wash-board.”²³⁵ For some employing farmers, the ability to continue to command human labor inexpensively made the incorporation of machines into their systems of mobilizing hired labor less of a priority.

Conversely, demand for labor is one of the reasons machines came to predominance in western areas without robust systems of hired labor due to the lack of large landless populations who relied on the wages of farm work. When one farmer wrote to McCormick in 1856 to ask about machines, he noted that his area in Minnesota was “in great want of machines” in large part because, “there are to[o] few laborers for

²³³ Aaron Lee, *From the Atlantic to the Pacific* (Seattle: Metropolitan Press, 1915), 9.

²³⁴ “Crops-Fair-Human Reaping Machines-Improvement of Horses.” *Ohio Cultivator*, August 15, 1850, 245.

²³⁵ Emphasis in original. “Washing Machines.” *Ohio Cultivator*, February 1, 1858, 47.

harvesting our grain in proper time.”²³⁶ The need for machines to augment scarce hired labor weighed differently on different farmers within the same region as well. Smaller farmers had different demands than larger farmers, for instance, and the farm press considered which machines were appropriate for different farmers.²³⁷ Yet increased westward migration, and the dearth of available labor in western areas, contributed to the use of machines in the Midwest by the 1860s.²³⁸

The incorporation of machines opened space for new roles for hired farm labor. Some hired hands took on machine roles. In the early 1860s, Hade Wells—the local man who Calvin Fletcher hired to mow and reap for him, and later shared a machine with—nearly always drove the machine and seemed to direct the mechanized harvest process. Wells did similar machine work for others in the area.²³⁹ Wells was not, however, the only hand involved in Fletcher’s harvest who drove machines. One instance was when Fletcher had a regular hired worker drive the reaper for what appears to be his once and only time in 1865 when Wells was sick.²⁴⁰ The next day, Fletcher noted that a black worker showed up from Kentucky, possibly with some experience with reaping and

²³⁶ Guss Belcourt to Cyrus Hall McCormick, May 25, 1856, McCormick Mss 2X, Micro 2021, Reel 5, Frame 309-310, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society.

²³⁷ For contemporary discussion of how large a farming operation had to be to justify the purchase of machinery, see, “Reaping and Mowing Machines.” *Prairie Farmer*, February 1854, 71; “Harvesters.” *Prairie Farmer*, September 1846, 285; “Relating to Machines.” *Prairie Farmer*, September 1849; “Farm Implements and Machinery.” *Canadian Agriculturalist*, January 16, 1861, 42.

²³⁸ Fred A Shannon, *The Farmer’s Last Frontier: Agriculture, 1860-1897* (New York: Routledge, 1977), 125-127; Bidwell and Falconer, *History of Agriculture in the Northern United States*, 281-305, 337-338.

²³⁹ Fletcher, *Diaries*, vol. 8, (1863-1864), June 8, 1863, 153. Fletcher, *Diaries*, vol. 8, (1863-1864), July 2, 1863, 168; Fletcher, *Diaries*, vol. 8, (1863-1864), July 10, 1863, 173-174; Fletcher, *Diaries*, vol. 8, (1863-1864), June 9-10, 1864; 412; Fletcher, *Diaries*, vol. 8, (1863-1864), July 11, 1864, 428. For Wells doing work for another farmer, named Keyes, see Fletcher, *Diaries*, vol. 8, (1863-1864), July 25, 1864, 431.

²⁴⁰ Fletcher, *Diaries*, vol. 9, (1865-1866), June 21, 1865, 107.

mowing machines, as Fletcher had him running the machine the same day he arrived, with Wells still out sick.²⁴¹ Hired workers thus contributed to the production of mechanized grain agriculture through their knowledge, skill, and labor with machines.

The incorporation of farm machines into hired labor systems gave rise to new types of transactional relationships and brought industrial capitalism to the farm. Farmers paid cash for the use of machines. An early reaper buyer wrote to the *Ohio Cultivator* in 1850 that he had success charging \$2 a day for the use of his reaper on other farms.²⁴² Anson Buttles paid someone \$19.50 for mowing in 1866, which likely included payment for the use of the machine over a period of time.²⁴³ Machines became the center of a new aspect of labor organization on the farm which involved not only paying cash to secure the necessary labor power, but also to secure the use of machinery. Some farm families thus turned machines into another source of profit.

Other farmers and hired men took on new roles in hiring out the services of their labor with machines alongside the machines themselves. Samuel Randle of Illinois, for instance, recorded that his family made \$200 the first harvest in which they owned a

²⁴¹ Fletcher, *Diaries*, vol. 9, (1865-1866), June 22, 1865, 106; Fletcher, *Diaries*, vol. 9, (1865-1866), June 22, 107; While this particular individual seems to have only just arrived in Marion County in 1865, many of the black farming people that Fletcher hired were likely known to him. They were members of the many rural black communities in the nineteenth-century Midwest, including both landed farmers and hired hands. For more on black farmers in the Midwest, see, Cox, *The Bone and Sinew of the Land*; Vincent, *Southern Seed, Northern Soil*; David Schob, 86, remarks on Fletcher's hiring of black farm-workers, but was unsure if any of those workers ran the machines during his periodization of 1815-1860. Fletcher's diaries from the 1860s show that at least one did so in ensuing years; Hildt, 292, George Hildt also worked his machine on a farm in Kansas where enslaved workers were present in October 1857. These men may have participated in the machine work as well, but Hildt does not specify.

²⁴² "Reaping Machines." *Ohio Cultivator*, August 15, 1850, 243.

²⁴³ Buttles, Cash Accounts, August 7, 1866, Reel 2.

reaper by harvesting with their machine for neighbors.²⁴⁴ George Hildt hired out his own services cutting grass and grain in Kansas with the combined machine shortly after purchasing it with a friend and neighbor in 1857. Their small group of men became the machine harvesters of their area for that summer. They did not, however, start out as machine experts. In fact, Hildt remarked on their “greenhorn” status when it came to prairie farming in general, let alone with a new machine, upon their first use of the machine on August 1st. One of his partners got his whip stuck in the cogs of the machine. It choked the wheels and made slow work for hours until they discovered the source of the problem. Over the course of that summer, however, Hildt and his partners did machine reaping and mowing for several other farmers and developed an aptitude for it.²⁴⁵ Systems of hiring labor were thus altered as they joined with machine systems to form new technological systems of industrial farming.

Farmers and hired workers created new roles within the labor process of threshing by machine as well. Some rural men formed threshing crews to travel around after the harvest and thresh for neighbors, family, and even strangers, occasionally to change work, but more often for pay. Ten-year-old Solomon Stein’s father operated a threshing machine operation in the mid-1870s and they spent months traveling to various farms threshing.²⁴⁶ While operating a threshing rig was time-consuming, it provided a new

²⁴⁴ Randle, “Reminiscences,” p. 72.

²⁴⁵ George Hildt, 278-294.

²⁴⁶ Solomon A. Stein, “Solomon A. Stein Diary,” (1873-1924), October 1873, Solomon A. Stein Diary Collection. Tavistock and District Historical Society. Accessed via Rural Diary Archive. <https://ruraldiaries.lib.uoguelph.ca/transcribe/collections/show/48>; Stein, “Diary,” October 1874; Stein, “Diary,” October 1875.

space in rural communities and labor organization for men who honed their machine skills and knowledge.²⁴⁷ There were also many distinct and specific roles that had to be performed in the machine threshing process.²⁴⁸ The use of travelling machines became the most common method of threshing in the second half of the century.²⁴⁹ Yet even as traveling threshing operations became common, other farming people still participated in the mechanized process. When a threshing rig showed up, the men of the community still performed whatever tasks on or around the machine the crew needed for the threshing of their own wheat and that of neighbors and family.²⁵⁰ The systems of hired work and community reciprocated work thus overlapped in this part of the production of mechanized agriculture.

Farming people thus fit machines into their multiple methods of organizing labor, sometimes with conflicts and other times more seamlessly. In doing so, they began building practices of machine use and machine knowledge rooted in their social relationships and efforts to make a living as farmers. Farming people produced

²⁴⁷ Garland, *A Son of the Middle Border*, 51, 156-159; Hamlin Garland, *A Daughter of the Middle Border* (New York: MacMillan, 1921), 252.

²⁴⁸ Rikoon, *Threshing in the Midwest*, 40-48.

²⁴⁹ On the predominance of threshing crews, see, Rogin, 172, and Rikoon, *Threshing in the Midwest*, 48-57.

²⁵⁰ George Harrouff, "Diary" (1872-1944), August 31, 1876, MS 1058, George Harrouff Diary, 1872-1944, Kansas State Archives; George Allen, "Diaries, Volume 1" (1874-1879), August 6, 1874, Micro 786, Reel 1, Wisconsin Historical Society, August 6, 1874; Henry A. Griswold, "Diary, January 1862-December 1871," September 27, 1866, p. 112; Henry A. Griswold, "Diary, January 1862-December 1871," August 24, 1869, p. 182; Henry A. Griswold, "Diary, January 1872-December 1879" (1872-1879), August 1874, p. 65, MS-BC260, Box 1, Henry A. Griswold papers, Abraham Lincoln Presidential Library and Museum; Brackett, "Journals, Volume One," September 9, 1863, p. 2; Brackett, "Journals, Volume One," September 20, 1864, p. 66.

mechanized agriculture as a system out of their own social systems of mobilizing labor. In doing so, they began to bring industrial capitalism to the social world of farm labor.

Systems of Crops and Landscapes

When farming people brought machines into their lives, they had to build new relationships between humans, machines, and the organic world as well. Farm families brought the use of machines into their agricultural practices of growing particular crops—especially wheat—on particular fields. They applied their growing knowledge of those mechanical systems to accommodate the machines to their environments and even took some steps to accommodate their environments to the demands of their new machines. There were struggles and accommodations: between people, machines, and environments, but also between farming people and promoters of mechanized agriculture outside the farming community. Farming people responded to the enthusiasm of railroad men and other industrial promoters of mechanized agriculture with their own efforts to make machines work only as far as those machines would do so within the environmental systems of the farm. Some schemes of mechanization thus did not come to fruition, and farming people also solved other incompatibilities between their environments and machines by adjusting their machine-use practices to meet the needs of their living world.

Field machines could only save or accelerate labor under certain physical conditions. Most machines struggled to operate when crops and soil were too wet.²⁵¹ Conditions were so wet in one rural community over the entire harvest season that the local McCormick agent proposed deferring orders and payments for mowing machines until the next year because he believed that the cost to “keep up their machines if they will take them” would be too high for his agency to bear.²⁵² The judges of an 1875 trial of harvesters awarded one machine over another due to the losing machine’s reliance on a rubber belt that was liable to “choke” in damp weather.²⁵³ Wet conditions were a perennial problem for field machines as they often were for farmers.²⁵⁴

While some reapers, mowers, and threshers could be made to work, the difficulties of working in wet conditions prevented farmers from adopting whole categories of machines that were otherwise championed by the farm press and industrial promoters. Agricultural papers began speculating about “steam plows” in the late 1850s. The Illinois Central Railroad cooperated with the State Agricultural society to offer a prize of \$50,000 for the successful invention of a steam plow.²⁵⁵ The efforts of J. Fawkes, a mechanic from Philadelphia, received the most press attention.²⁵⁶ Other inventors

²⁵¹ Peterson, “Diary and Translation” (August 6, 1872), 264; Peterson, “Diary and Translation” (August 7, 1872), pg. 264.

²⁵² B. Sawyer to Cyrus Hall McCormick, June 15, 1867, Box 25, C.H.M. Correspondence.

²⁵³ “Victory over the Marsh at the Farm of Mr. Joseph Luckey, Jerseyville, Ill., June 29th.” *Grange Advance*, July 20, 1875, 7.

²⁵⁴ For other farming people who noted the difficulties of harvesting machines in wet conditions, see, Brackett, “Journals, Volume Three,” August 27, 1872, p. 148.

²⁵⁵ Paul Wallace Gates, “The Promotion of Agriculture by the Illinois Central Railroad, 1855-1870,” *Agricultural History* 5, no. 2 (April 1832): 66-67.

²⁵⁶ “Fawkes Steam Plow.” *Prairie Farmer*, September 30, 1858, 209; “Fawkes’ Steam Plow.” *Prairie Farmer*, October 7, 1858, 225; “Further Reports from the Steam Plow at Centralia.” *Prairie Farmer*,

subsequently offered their versions of the steam plow as well.²⁵⁷ The railroad men who offered the prize were likely enthused by the similarities between the systems of steam-powered technology they commanded and a device that could potentially augment their own profits through the agricultural development of western states. Newspaper editors shared their enthusiasm for greater mechanization. Farming people participated in these discussions just as they participated in enthusiasm for reapers and threshers, but they could not accept the steam plows of the nineteenth century. Fawkes' machine had some success when soil was dry enough to support its weight, but when tested in fields that were even a little damp, it sunk into the ground.²⁵⁸ Nineteenth-century steam plows ultimately ended in failures so significant that the *Prairie Farmer* still recalled them more

October 21, 1858, 257; "Steam Plow Trial." *Prairie Farmer*, November 18, 1858, 321; "The Steam Plow Trial at Philadelphia." *Prairie Farmer*, June 7, 1859, 8; "Fawkes Steam Plow Again." Editor's Memoranda. *Prairie Farmer*, August 18, 1859, 104; "Steam Plow Premium." Editors' Memoranda. *Prairie Farmer*, September 22, 1859, 185; "Fawkes' Steam Plow 'Lancaster.'" *Prairie Farmer*, October 13, 1859, 225; "Report: Of the Executive Committee of the Illinois State Agricultural Society." *Prairie Farmer*, February 9, 1860, 84; "Personal Items." *Prairie Farmer*, April 26, 1860, 264; "Steam Plowing Triumphant." *Prairie Farmer*, April 26, 1860, 273; *Prairie Farmer*, May 17, 1860; "Inventors and Inventions." *Prairie Farmer*, May 24, 1860, 324; See also, "Progressive Age-Plowing by Steam." *Ohio Cultivator*. January 15, 1851, 21.²⁵⁷ "Steen's Steam Plow." *Prairie Farmer*, October 20, 1859, 244; "Leavitt's Steam Cultivator." *Prairie Farmer*, November 24, 1859, 325; "Waters' Steam Plow." *Prairie Farmer*, August 9, 1860, 88.²⁵⁸ "Fawkes Steam Plow." *Prairie Farmer*, September 30, 1858, 209; "Fawkes' Steam Plow." *Prairie Farmer*, October 7, 1858, 225; "Further Reports from the Steam Plow at Centralia." *Prairie Farmer*, October 21, 1858, 257; "Steam Plow Trial." *Prairie Farmer*, November 18, 1858, 321; "The Steam Plow Trial at Philadelphia." *Prairie Farmer*, June 7, 1859, 8; "Fawkes Steam Plow Again." Editor's Memoranda. *Prairie Farmer*, August 18, 1859, 104; "Steam Plow Premium." Editors' Memoranda. *Prairie Farmer*, September 22, 1859, 185; "Fawkes' Steam Plow 'Lancaster.'" *Prairie Farmer*, October 13, 1859, 225; "Report: Of the Executive Committee of the Illinois State Agricultural Society." *Prairie Farmer*, February 9, 1860, 84; "Personal Items." *Prairie Farmer*, April 26, 1860, 264; "Steam Plowing Triumphant." *Prairie Farmer*, April 26, 1860, 273; *Prairie Farmer*, May 17, 1860; "Inventors and Inventions." *Prairie Farmer*, May 24, 1860, 324; See also, "Progressive Age-Plowing by Steam." *Ohio Cultivator*. January 15, 1851, 21; Larger types of horse-drawn harvesters might also have struggled thanks to similar difficulties. See, "Churchill and Danford's Harvesting Machine." *Prairie Farmer*, August 1841, 61; "Harvesting and Threshing Machines Out West," *Ohio Cultivator*, October 1, 1850, 298; Charles L. Hill. *The First Combine. The Wisconsin Magazine of History*, Vol. 35, No. 4 (Summer, 1952): 263-266; "Esterly's Harvester." *Prairie Farmer*, September 1849, 281; "Esterly's Harvester." *Ohio Cultivator*, June 1, 1850, 163-164.

than a decade later.²⁵⁹ The demands of environmental conditions stood in the way of the designs of steam plow promoters.

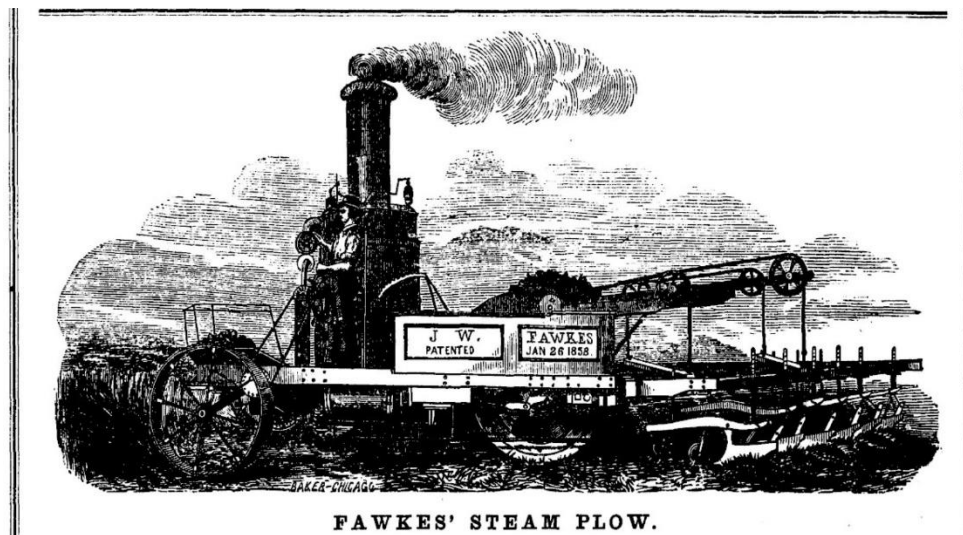


Figure 8: "Fawkes' Steam Plow." *Prairie Farmer*, October 7, 1858, p. 225.

Horse-drawn field implements like reapers and mowers were successful in part because they were lighter than steam plows, but also because farming people could combine their use with hand implements. Farming peoples' solution to wet conditions when using horse-drawn field machines was often simply to use hand implements until the fields and soil dried. Martha Woodbury recorded that her husband and sons sought to borrow cradles from neighbors during one particularly wet period.²⁶⁰ The use of old implements, even when machines were present, was an adaptation of machine-use

²⁵⁹ "Parvin's Steam Plow." *Prairie Farmer*, November 2, 1872, 346; "Steam on the Farm and Road." *Prairie Farmer*. August 17, 1878, 258. For other speculations on steam plows, see, "Evans Steam Plow." *Farmers' Union*. October 18, 1873, 329; "Parvin's Steam Plow." *Farmers' Union*, June 13, 1874, 177.
²⁶⁰ Woodbury, Woodbury, and Woodbury, "Diary," p. 176-177; See also, Douglas McTavish, "Diary" (1876-1877), August 25, 1877, Douglas McTavish Diary Collection, Huron County Museum and Historic Gaol, Accessed via Rural Diary Archive. <https://ruraldiaries.lib.uoguelph.ca/transcribe/collections/show/8>.

practices to the environmental conditions on the farm without which new technological systems could not have been produced.

The users of threshing machines also had to overcome the restrictions of damp conditions. B. J. Cochrane of Dakota wrote that “heavy dew often delayed action until the sun had burned off the moisture” that had gathered on both the machine and the crop it was meant to thresh.²⁶¹ Machine threshing faced even greater challenges, perhaps, from wind. Threshers had to be careful in how they arranged the machine. They had to make sure that the wind would not blow away the bundles of grain or blow the dust shaken up by the machine into the faces of the men working. Too much straw blown around by the wind forced Anson Buttle’s threshing operation to quit for the day in 1869. On another occasion, they stopped working and rearranged the entire threshing operation so that the wind would no longer be blowing directly into the machine.²⁶² Farming people thus adjusted their practices to make machines work in the conditions they confronted.

Farming people applied their newfound machine knowledge to produce technologies that were compatible with their crop systems. They did so, for example, by tinkering with their machines to better adjust them to crop conditions like thick clover. Farming people found themselves in the position of adapting machines to work in different crop conditions. Mowers could experience difficulty with grass on prairies where live grass was tangled with dead grass.²⁶³ Ontario farmer John Ferguson noted that

²⁶¹ Burba, 417.

²⁶² Buttles, September 13, 1867, Reel 2; Buttles, September 16, 1869, Reel 2.

²⁶³ John Clowney to R. C. Olin, August 10, 1864, *South Dakota Historical Collections*. (Pierre: State Publishing Company, 1916), Vol. 8. p. 430.

his mower struggled with “short wire grasses.”²⁶⁴ Mowing machines also struggled with the thick clover that Midwesterners grew on their farms. Company agents wrote to the McCormick home office in Chicago of the tendency of thick clover to clog the serrated sickle sections of the mower’s cutting apparatus.²⁶⁵ Lorenzo Dow Brown responded to this difficulty in his own farming community when he tightened the sickle sections of his neighbor’s mower in 1859 to prevent the chronic problem of it clogging on thick clover. He also mentioned that he hoped doing so would alleviate the stress that the machine was putting on the horses when dragged through the clover.²⁶⁶ Brown was thus concerned with the machine’s compatibility both with certain crops as well as with animals. Farming people tinkered to make machines more compatible with the conditions of crops and animals throughout the coming decades.²⁶⁷

Farming people also had to address the problem of “lodged”—that is, tilted, or slanted—crops in their efforts to produce systems of mechanized agriculture in their crop cultivation. McCormick agents discussed the difficulty machines faced in any type of lodged grass that had been pushed into a tilting position by weather.²⁶⁸ Farmers wrote to

²⁶⁴ Ferguson, “1872 Diary,” (July 3, 1872).

²⁶⁵ N. A. Brudden to Cyrus Hall McCormick, April 29, 1854, McCormick Mss 2X, Micro 2021, Reel 5, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society; Stephen Eldred to Cyrus Hall McCormick, July 3, 1854, McCormick Mss 2X, Micro 2021, Reel 5, Frame 219, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society.

²⁶⁶ Lorenzo Dow Brown, “Journal Transcriptions,” July 3, 1859, Box 3, Folder 1, p. 23.

²⁶⁷ This is addressed most directly in chapter 4.

²⁶⁸ Stephen Eldred to Cyrus Hall McCormick, July 3, 1854, McCormick Mss 2X, Micro 2021, Reel 5, Frame 219, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society; Eber Jones to Cyrus Hall McCormick, “McCormick’s Reaper and Mower, Warranted to Be the Best in Use,” April 26, 1855, McCormick Mss 1A, Box 7, C.H.M. Correspondence.

newspapers to ask specifically about how mechanical reapers could handle lodged grain.²⁶⁹ Others took matters into the own hands. In one case, Henry A. Griswold of Illinois used his reaper only in one direction, rather than turning it around each time it came to the end of the field. This practice would have taken longer to harvest but it also would have saved the tilted crop and the machine from damaging one another.²⁷⁰ These adaptations to particular circumstances constituted machine-use practices that made industrial mechanized farming possible.

The use of hand implements alongside machines, as noted above, was another solution to the problem of lodged crops—a solution in which farming people only pushed mechanization as far as made sense within their systems of crop cultivation. While the use of new technologies seldom fully replaces its predecessor, here farming people used implements not only to supplement machines, but as a distinct part of the whole technological system of mechanical harvesting.²⁷¹ Lodged grain had long been a difficulty, even before the introduction of reapers. Even the cradle struggled with lodged grain, in comparison to the sickle.²⁷² Calvin Fletcher struggled to cradle his “completely laid down” grain in 1847.²⁷³ Nevertheless, when he was confronted with lodged grain again in later years he returned to the cradle when the reaper could not cut it.²⁷⁴ The

²⁶⁹ “Inquiry about Reaping Machines.” *Ohio Cultivator*, December 1, 1847, 181; Some advertisements claimed that their machines handled lodged grain better than others. “The McCormick Binder.” *Grange Advance*, August 9, 1876, 8.

²⁷⁰ Henry A. Griswold, “Diary, January 1862-December 1871,” July 7, 1868, p. 155.

²⁷¹ See, for instance, Edgerton, *The Shock of the Old*.

²⁷² Rogin, 72.

²⁷³ Calvin Fletcher, *The Diary of Calvin Fletcher*, ed. Gayle Thornbrough, Dorothy L. Riker, and Paula Corpuz, vol. 3, 1844–1847 (Indianapolis: Indiana Historical Society, 1974), July 5, 1847, 393.

²⁷⁴ Fletcher, *Diaries*, vol. 8, (1863-1864), July 21, 1864, 418.

Canadian Agriculturalist also noted, in a discussion of reapers, that “some seasons, it is true that only part of the crop can be cut by machinery.”²⁷⁵ Farmers thus kept their old implements, like cradles, around for the times and places when new machines were incompatible with their crops. Their mixed use of hand implements and machines was a strategy of machine use that accommodated environmental challenges and machine limitations and allowed systems of mechanized agriculture to be produced even when manufacturers’ machines fell short of their claims and could not complete a full harvest by themselves. Farmers thus enthusiastically used new machines, but only as far as they could effectively in the context of their environmental conditions. Even if a machine cut the bulk of a farmer’s grain, the machine did not immediately replace hand tools, but was given a use alongside them.

Another issue of compatibility between machines and crops concerned machines and seeds. From the 1840s on, farmers worried about the effects of the violent process of machine threshing on the seeds of their grasses or grains. In 1843, a contributor to the *Prairie Farmer* reported that “several farmers who have made careful observations” claimed that some threshing machines would preserve seeds just fine, while others would injure them to the point of uselessness.²⁷⁶ Farmers’ diaries show that some of them did use threshing machines to gather seeds, from both grasses and grains, and thus must have either found machines that would separate seeds safely, or developed practices for that

²⁷⁵ “Reaping Machines.” *Canadian Agriculturalist*, August 16, 1861, 485-487.

²⁷⁶ “Threshing Seed Grain.” *Prairie Farmer*, January 1843, 3.

task.²⁷⁷ Some farmers, such as a contributor to the *Prairie Farmer* who identified himself as “Corn Cracker,” objected to the use of harvesting machines as well on the grounds that they damaged the wheat as they cut it.²⁷⁸ Machine compatibility with seeds was naturally a concern when it came to the use of seed drills as well.²⁷⁹ The needs of particular crops conditioned farmers’ priorities and practices, whether they found machines that did not harm their seeds, ways to make sure their machines did not harm their seeds, or decided not to use machines.

Farming people also produced systems of mechanized agriculture out of the relationships between machines and the landscapes they traversed in the harvest. Horse-pulled machines—such as drills, reapers, and mowers—generally operated better on flat land free from physical obstructions than they did on hilly land or fields filled with bumps, rocks, or stumps. Even gopher and prairie dog holes on the fields of the prairie states could cause some problems for reapers and mowers.²⁸⁰ Midwestern land tended to be flatter and more free from obstruction than the land in Eastern regions, and nineteenth-

²⁷⁷ Benjamin Reesor, “Benjamin Reesor Diary Transcript” (1866-1870), June 29, 1867, Benjamin Reesor Diary Collection, Markham Museum, Accessed via Rural Diary Archive. <https://ruraldiaries.lib.uoguelph.ca/transcribe/collections/show/14>; John Ferguson, “John Ferguson 1870 Diary Transcripts” (1870), January 3, 1870, John Ferguson Diary Collection, Peel Art Gallery, Museum and Archives and Archives of Ontario. Rural Diary Archive; Ferguson, “1871 Diary Transcripts,” February 7-11, 1871.

²⁷⁸ “Reapers vs. Cradles.” *Prairie Farmer*, December 1, 1848, 377.

²⁷⁹ “Emery’s Albany Seed Planter.” *Prairie Farmer*, September 1848, 275; “Albany Corn and Seed Planter.” *Prairie Farmer*, April 30, 1870, 135; “The Farmer’s Friend Grain and Fertilizer Drill” (Farmer’s Friend Manufacturing Co. Dayton, Ohio, 1877), Item ID: 08055057, Hagley Library, Trade Catalogs.

²⁸⁰ Hildt, 280; Henry Wallace, *Uncle Henry’s Letters to the Farm Boy* (Des Moines: Wallace Publishing Co., 1897), 23.

century contemporaries would point to this reality as a reason that Midwestern wheat farmers mechanized faster than their Eastern counterparts.²⁸¹

While the Midwest as a region was generally better suited to reapers and mowers than Eastern states, fields in the Midwest and Ontario were not all perfectly flat and clear. Stumps and rocks were an obstruction in landscapes that farming people had to confront in their efforts to produce systems of mechanized agriculture.²⁸² The *Canadian Agriculturalist* opined, in 1861, that “on old cleared farms the reaper and mower are a great saving of labour; but where the land is new, stumpy or uneven they are only an expense.”²⁸³ Some entire communities seem to have used fewer machines than others due to hills, stumps, or other obstructions.²⁸⁴ Farming people thus had to confront the nature of their landscapes as they produced systems of mechanized agriculture and only mechanized their operations as far as was accommodatable to the environmental landscapes of their fields.

Machine manufacturers claimed to offer machines that were compatible with different field conditions. Farmers prioritized the compatibility of machines with fields as consumers. An 1853 reaper and mower trial in Ohio, for instance, rated machines in a

²⁸¹ *U.S. Census Reports, Tenth Census. June 1, 1880: Manufactures* (Washington: GPO, 1883), 688. https://www.google.com/books/edition/Census_Reports_Tenth_Census_June_1_1880/Xm9GAQAAMAAJ?hl=en&gbpv=0, 694.

²⁸² Farmers in some areas that were particularly stumpy evidently did not use machines as early or thoroughly as those in more compatible areas. See, for instance, “The Woody Lake Region.” Editorial Correspondence. *Prairie Farmer*, September 1849, 289.

²⁸³ “Machines and Implements.” *Canadian Agriculturalist*, February 16, 1861, 125.

²⁸⁴ See, for instance, “Funds to Carry on the State Agency.” *Farmer’s Union*, August 22, 1874, p. 261. Microfilm, Minnesota Historical Society.

separate category for their performance on hills, around stumps, and with lodged grain.²⁸⁵ At least one man received a patent for a design meant for use on uneven land. George Hart's patent claimed the invention of "a revolving grass or grain cutter, so as to adapt itself to the varying surface of the ground, by means of hanging it by a universal joint on the end of a shaft adjustable vertically," and was reported on in a list of new patents in the *Ohio Cultivator* in 1850.²⁸⁶ Manufacturers would continue to claim innovations that would allow machines to better deal with rough fields. A trade catalog for the Richmond Champion Grain Drill, for instance, offered a spring attachment meant to allow farmers "without detention, trouble, or breakage, to work land that is stumpy or rocky."²⁸⁷

Farmers also sometimes sought to adapt their fields to the needs of machines through the use of other manufactured devices and, in so doing, further entrenched their farms in industrial capitalism. One modification of fields involved the use of another type of horse-drawn implement: the roller. Rollers flattened the upper layer of soil on a field. Farmers who used rollers often did so before planting seeds. Some farmers considered rolling the best way to prepare soil for drills, as the flat and slightly compressed soil made good terrain for the drill to evenly place seeds.²⁸⁸ But rolling could also help when it came time to harvest as well. Minnesota farmer John Cummins noted in his 1861 diary that his reaper "went rather hard" and accomplished much less than usual on a field that

²⁸⁵ "Trial of Reaping and Mowing Machines." *Ohio Cultivator*, June 1, 1853, 174.

²⁸⁶ "List of New Patents." *Ohio Cultivator*, December 1, 1850, 353-354.

²⁸⁷ *The Richmond Grain Drill* (Wayne County, IN: Wayne Agricultural Co., 1875). Indiana Memory Digital Collection. <https://indianamemory.contentdm.oclc.org/digital/collection/p16066coll3/id/4037>.

²⁸⁸ "The Roller." *Ohio Cultivator*, October 1, 1845, 112; "Spring Wheat." *Prairie Farmer*, February 1843, 27; "Spring Wheat." *Canadian Agriculturalist*, April 2, 1860, 139.

he had neglected to roll earlier in the season when he was doing his planting.²⁸⁹ Rolling fields allowed farmers to use a manufactured product in order to make their fields better for other manufactured products like mechanical reapers.

The stump remover was designed to make fields more compatible with drills, reapers, and mowers, making fields clear for horse-drawn machines. One contributor argued that “the necessity of a cheap and efficient machine to remove stumps has been infinitely increased by the use of the above [mowing and reaping] machines.”²⁹⁰

Naturalist John Muir remembered using one of these machines in his adolescence, explicitly to make way for a McCormick reaper.²⁹¹ Some farming people participated in the enthusiasm for these devices. One farmer, for instance, wrote with advice to the maker of an advertised stump-remover about a mechanical problem he saw in the device and described his own system of removing stumps.²⁹² Farmers thus continued to claim an equal role in the creation of systems of mechanized agriculture out of farm systems that included their particular landscapes.

Yet many farmers did not accept the recommendations of the farm press to use machines to adapt their fields to other machines and instead adjusted—or even moderated—their machine-use practices to fit with their landscapes. They did not simply

²⁸⁹ John Cummins, “Diaries” (1855-1918), July 15, 1861, Reel 1, Frame 592, M 447, , John R. Cummins Papers, 1834-1921, Minnesota Historical Society.

²⁹⁰ “A Machine to Remove Stumps.” *Ohio Cultivator*, March 1, 1849, 70-71; “That Stump Machine-Disease in Swine.” *Ohio Cultivator*, April 1, 1849, 100; “Stewart’s Stump Machine.” *Prairie Farmer*, April 1851, 158.

²⁹¹ John Muir, *The Story of My Boyhood and Youth* (Boston: Houghton Mifflin Company, 1916), 175.

²⁹² “To Remove Stumps.” *Prairie Farmer*, April 1849, 275.

adopt machines because manufacturers offered them. Even as stump removers and rollers addressed familiar problems, the more common response was to use the old cradle, just as farmers often did to deal with lodged grain. Farmers cradled not only around stumps and rough ground, but also around every kind of obstruction including fence posts.²⁹³ They used cradles over machines to harvest oats as well as wheat.²⁹⁴ While the compatibility between land and machine was important, there were limits on farming peoples' abilities and willingness to reshape their fields to the needs of machines, and they instead adapted other practices. They adjusted and moderated their practices of machine use to suit the needs of their own landscapes, and thus adjusted to their specific landscapes rather than attempt to standardize the land itself.

Farmers could also use cradles not only to reach areas that were hard for the machines to get, but also to better prepare their entire fields for machines. Lorenzo Dow Brown, for instance "rounded the corners of E [East] field for Machine," and Ontario farmer Courtland Olds observed his son cutting "around the spring wheat field" with a cradle to leave only the wheat that would be in the direct path of the reaper.²⁹⁵ Another strategy was to cut "roads" through the wheat fields for a reaper to ride through while cutting.²⁹⁶ Irvin W. Rollins also recorded instances of his sons preparing the crop for

²⁹³ Reesor, "Diary Transcript." August 22, 1868. ; Lorenzo Dow Brown, "Journal Transcriptions," March 31, 1863, Box 3, Folder 8, p. 10.

²⁹⁴ Robert D. Clark, *Rain Follows the Plow: Homesteading in Hayes County, Nebraska: The Story of Warren and Ada Clark* (Lincoln: Foundation Books, 1996), 22.

²⁹⁵ Lorenzo Dow Brown, "Journal Transcriptions," July 7, 1873, Box 3, Folder 12, p. 42; Courtland Olds, "Courtland Olds' 1867 Diary" (1867), August 21, 1867, Courtland Olds Diary Collection, Archival and Special Collections, University of Guelph, Accessed via the Rural Diary Archive.

²⁹⁶ Buttles, August 15, 1868, Reel 2; Buttles, August 29, 1869, Reel 2.

machine harvesting. In 1875, he noted that one son “mowed some oats on East side to have room to turn when reaping oats badly lodged.”²⁹⁷ One type of machine—the mower—was thus a part of machine-use practices for the operation of another—the reaper. Farming people had to manipulate other crops in order for the reaper to be used on grains, such as when Bartholomew Elam recorded “forming flax out of the way of the reaper” in 1875.²⁹⁸ The mixed use of hand implements and machines together was a strategy that allowed farmers to circumvent the limitations of machines and to make them work with the conditions of their crops and fields.

Farmers applied their deep knowledge of the crops they grew, the fields they worked, and the machines they were coming to use in order to make them work together. These strategies sometimes did not align with the priorities of farm press promoters of mechanization or with those of machine manufacturers. Nevertheless, farmers’ adaptations of machines to their environments and *vice-versa* were essential components to the production of mechanized agriculture as a system composed of crops and fields as much as of machines and people.

Animal Systems

Farmers also had to fit their machines into systems of animal husbandry where farming people exploited the labor of draft animals. Field machines were designed from

²⁹⁷ Rollins, “Diary,” August 5, 1875, Reel 3. Rollins, “Diary,” July 29, 1876, Reel 3.

²⁹⁸ Elam, July 21, 1873.

the beginning to be powered or driven by horses, but the task of maintaining a functioning relationship between the human, animal, and machine was another that fell to farming people. Farming people had to adapt both the demands they placed upon their own bodies, as well as the bodies of their animals, to the dictates of the machine. Yet they also adapted their use of machines to the capabilities of their own bodies and their systems of animal husbandry.

Fawkes' steam plow was unsuccessful due to its inability to work on damp ground and also struggled against the preference of most farming people for animal-powered machinery over steam powered. One farmer wrote of Fawkes' steam plow even before damp grounds revealed its weaknesses:

Who among us, as farmers of from one to five hundred acres, wishes to employ a cumbrous piece of machinery to do our plowing, merely for the name of the thing? As farmers must necessarily keep a certain amount of horse and ox power, steam or no steam, sufficient no doubt for all plowing, harrowing and hauling purposes.²⁹⁹

The farmer concluded that animal-drawn plows would better fit with farmers' technological and farm systems because they already had a myriad uses for the animals that would not make the animals obsolete with the adoption of a steam plow. Farming people thus continued to harvest with the form of motive power that operated best in their own production of technological systems rather than those most championed by the farm press and railroad promoters of mechanization.

²⁹⁹ "Steam Plowing-A Disbeliever." *Prairie Farmer*, November 11, 1858, 307.

Yet the use of animal-power was conditioned by difficult relationships between animals, people, and machines. Accidents caused injuries for both people and animals.³⁰⁰ For instance, Anson Buttles noted an instance when a horse got its foot stuck in the wheel of a threshing machine.³⁰¹ Even without accidents, the powering of threshers was hard on horses. Calvin Fletcher observed that the treadmill horse power he used for his threshing machine in 1861 was very hard on his horses. The next year, he secured the use of a steam-powered thresher instead.³⁰² His priority to protect his horses may have actually helped convince him to opt for a technology that made their use in this process unnecessary. The jump to steam, in these decades, was beyond the reach or desire of most farmers who continued to use horse-powered threshers as well as harvesters. Harriet Connor Brown recalled that her family also moved away from the use of a treadmill horse power because “the horses got rebellious.”³⁰³ They had an easier time getting the horses to run a horse-sweep power, which remained the most common type of thresher power until later in the century, likely because that technological system worked best with horses on other farms as well. As farmers mechanized the threshing process, they did so by producing systems of mechanized threshing out of both machine and animal systems.

³⁰⁰ Garland, *A Son of the Middle Border*, 139; Robinson, 682; “A Life Preserver for Thrashers.” *Ohio Cultivator*, August 1, 1847, 107; Turner, 103-104; Fletcher, *Diaries*, vol. 8, (1863-1864), July 24, 1863, 181; Fletcher, *Diaries*, vol. 8, “1863-1864), July 30, 1863, 188; Fletcher, *Diaries*, vol. 8 (1863-1864), July 10th, 1864, 413. For more on the physical dangers of mechanized harvest work, see Schob, 108. For a discussion of the perils of agricultural work for children in particular, see, Riney-Kehrberg, 56-59.

³⁰¹ Buttles, September 4, 1873, Reel 2.

³⁰² Fletcher, *Diaries*, vol. 7, (1861-1862), July 17, 1861, 155; Fletcher, *Diaries*, vol. 7, (1861-1862), July 18, 1861, 156.

³⁰³ Harriet Connor Brown, 131.

As farming people produced systems of mechanized harvesting with reapers and mowers, they also sought to mitigate the strain placed on their animals by machines and looked for machines best adapted to use with their animals. Commenters on new machines noted the effects they had on horses. A contributor to the *Canadian Agriculturalist* even doubted whether many farmers' horses would be able to pull some machines at the necessary speed for a sustained period of time.³⁰⁴ Farmers also criticized large harvesters for the amount of strain their weight put on horses.³⁰⁵ It was likely in part for this reason that smaller reapers and mowers achieved a popularity that those larger machines did not. Meanwhile, the manufacturers of those smaller machines claimed that their particular machines would work the best with any farmers' horses.³⁰⁶ Minnesota farmer, John Cummins, demonstrated the importance of machine-horse compatibility when the first thing he recorded about his new reaper was that "this machine is very easy on the horses not tiring them but little."³⁰⁷ Indeed, horse-drawn machines could only work when constituted with animals as single technological systems.

The demands of farmers for machines that worked well with horses influenced the types of machines that manufacturers produced. From its earliest decades, the McCormick company heard from farmers about the relationship between machines and horses. In 1855, a farmer wrote to McCormick requesting a light machine that could be

³⁰⁴ "Reaping Machines." *Canadian Agriculturalist*, August 16, 1861, 485-487.

³⁰⁵ "Esterley's Harvester." *Ohio Cultivator*, June 1, 1850, 163-164.

³⁰⁶ "A Mowing Machine." Editor's Table. *Prairie Farmer*, October 1849, 327.

³⁰⁷ Cummins, "Diary" (July 13, 1860), Reel 1, Frame 526.

pulled by only two horses.³⁰⁸ A few years later, in 1859, a company agent in Michigan forecasted that he could sell a lot of reapers in his area, but only if “they do not worry the horses.”³⁰⁹ Cyrus Hall McCormick himself wrote back to an agent on a copy of a regularly issued circular that they would likely be switching to two-horse machines entirely, and another circular issued to agents in 1860 boasted that even the four-horse machine could be pulled by two horses.³¹⁰ Other companies advertised the lightness of their horse-drawn machines and even claimed capacity to run with one horse alone.³¹¹ The role farmers played as producers of mechanized systems with machines and animals bolstered their ability to shape the industry as consumers.

Machines also were subject to the problem of “side draft” when the weight of a machine was distributed unevenly onto one horse or another.³¹² Machine makers advertised the ability of their machines to operate with less side draft than others³¹³ The McCormick company claimed to address some of the concern for the welfare of draft horses when an advertisement for the 1861 mower claimed to have both reduced side

³⁰⁸ C. B. Ostrander to Cyrus Hall McCormick, December 15, 1855, McCormick Mss 1A, Box 7, C.H.M. Correspondence.

³⁰⁹ George Walker to Cyrus Hall McCormick, December 5, 1859, McCormick Mss 1A, Box 15, C.H.M. Correspondence.

³¹⁰ Cyrus Hall McCormick to Ray Little Co., May 1858, McCormick Mss 5X, Box 1, Folder 13, McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society; Cyrus Hall McCormick to John Morgan, June 1860, McCormick Mss 5X, Box 1, Folder 16, McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society.

³¹¹ “The Richmond Royce Reaper” (Wayne Agricultural Co., Richmond, IN, 1877), L354, Box 4, Folder 4, Isaac W. Beeson Papers, Indiana State Library, 5-6, 12.

³¹² Nineteenth-century farmers often referred to the issue as “side draught” and to their animals as “draught animals.” For the purposes of clarity, I have opted to use the modern spelling of the word “draft.”

³¹³ “The Climax Mower.” *Prairie Farmer*, July 10, 1869, 221.

draft and also to have stopped the machine from choking the horses as they pulled.³¹⁴ Nevertheless, manufacturers' efforts to reduce side-draft would continue, as agents in later years reported on the struggles of horses to pull the machine in a straight path because of the imbalance.³¹⁵ Machine companies continued to address this issue, as a circular for a horse-drawn machine from the Walter A. Wood company pointed out that the weight of the driver's seat balanced perfectly with the wooden tongue that bolstered the undercarriage of the machine.³¹⁶ Machine manufacturers thus endeavored to meet farmers' expectations for balanced machines that worked well with animal systems.

Even as manufacturers intended machines for horses, some few farmers made them work with other types of animals, including oxen and cattle, and thus produced technological systems out of animal components, even when doing so did not meet manufacturers' expectations.³¹⁷ George Hildt, for instance, considered the use of oxen or cattle to pull his new combined reaper-mower days after using it for the first time in late July 1857. He initially thought that using oxen would "choke" the knife, but when he came home to find a family member driving the machine with oxen, he noted, "You may think it strange to hear that oxen will work in a machine but such is the fact." Hildt was

³¹⁴ "McCormick's Reaper and Mower" (Chicago, 1861), McCormick Mss 5X, Box 1, Folder 18, McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society.

³¹⁵ P. Mohan to Cyrus Hall McCormick, May 26, 1867, Box 25, C.H.M. Correspondence.

³¹⁶ "Walter A. Wood Mowing and Reaping Machine Co. Circular for the Year 1872," 1872, Hagley Library, Trade Catalogs. 11-12.

³¹⁷ Anthony Ward, "Extensive Development of the Canadian Prairies: A Micro Analysis of the Influence of Technological Change" (Vancouver, University of British Columbia, 1990), 113-117, further discusses the relative adaptability of horses and oxen for different work on nineteenth-century prairie farms. The strength of oxen made them good for plowing and prairie breaking, while the speed and intelligence of horses made them better adapted for various types of machine work.

particularly enthused to see oxen working with the machine because he was more confident in his own abilities to drive oxen “anywhere with more ease than I could a span of horses [sic] indeed I fancy myself a No. 1 ox driver.”³¹⁸ Farmers like Hildt produced technological systems that fit with their own aptitudes with certain animals.

Farmers usually considered horses to be better adapted to threshing machines than oxen were, and the adoption of horse-powered threshing machines may have contributed to the relative predominance of horses over oxen on American farms in the second half of the nineteenth century. This was because farmers could train horses to step over the axle when running a horse-sweep power much more easily than they could teach oxen to do so.³¹⁹ Nevertheless, some farmers did use animals other than horses with their threshing machines. Anson Buttles, for instance, recorded using three horses and two yokes of cattle to power a thresher in 1860.³²⁰ The animal conditions on the farm determined what types of powers could be used more than manufacturers’ preferences.

In maintaining these functioning relationships between human, machine, and animal components farming people produced and directed new technological systems on their farms. Their deep knowledge of their animals and machines allowed them to build practices of machine use that coincided with their practices of animal husbandry. They even pushed manufacturers to alter their machines to better suit the needs of draft animals and used machines with animals in ways manufacturers never intended. Mechanization

³¹⁸ Hildt, 282.

³¹⁹ Rikoon, *Threshing in the Midwest*, 29-30.

³²⁰ Buttles, August 31, 1860, Reel 1.

was thus characterized by the ways in which farming people could make machines work with the humans and animals who performed farm labor.

Conclusion

Farming people participated in the enthusiasm for new machines delivered from the centers of commercial and industrial capitalism and championed by the farm press. Yet, as they learned about machines, they also began to use them in ways that were conditioned by the farm systems in which they lived and labored rather than by the visions of editors and manufacturers. Farmers confronted the machine and built it into their world by adapting it to their social lives and material contexts. They produced new technological systems that were constituted by the farm systems they built and lived within as well as by the machines they came to master. They did not, however, produce these technological systems in conditions of their own choosing. Farming people used machines in the economic context of the risks of nineteenth-century financial capitalism. Those economic contexts compelled them to not only produce systems of mechanized agriculture, but to maintain them as well.

Chapter Two

Risk and Repair: The Precarities of Financial Capitalism, the Mechanical Labor of Industrial Capitalism, and Maintenance, 1845-1875

Farmers throughout the Midwest and Ontario adopted machines through channels of commercial and financial capitalism. The commercial activities of machine sale and purchase were facilitated by the financial mechanisms of credit supplied by manufacturers and their agents to farmers via delayed payment agreements that sometimes included interest. These financial practices made the widespread adoption of machines possible, but they also brought significant risk to farmers. Cash-poor farmers relied on crops that were not yet harvested when they agreed to make future payments. There was also an added element of uncertainty in the form of machine breakages. Farm machines broke often, potentially leaving farmers unable to pay their machine and mortgage payments. Farmers thus responded to the precarities of financial capitalism with practices of machine maintenance and repair. They further developed and directed the technological systems on the farm that constituted industrial agriculture. By relying on the increasingly mechanical forms of labor involved in machine repair and maintenance, as well as on manufactured repair products, they brought industrial capitalism to their farms.

In pursuing maintenance and repair, farmers also found themselves in conflict with machine manufacturers, whose main interest was the sale of machines, while farmers were most interested in ensuring that any machines they had already purchased

would not become a loss due to breakage or other failures. They thus sought and found some autonomy from manufacturers and their agents in machine maintenance. Because manufacturers had not yet built machines with thousands of specialized parts, and also had not yet erected organizational structures with services far beyond the capacities of local farmers and mechanics, farming people were able to maintain some control of their technological systems through their control of machine maintenance and repair.

The study of maintenance and repair is important to scholarship on the relationship between capitalism and industrialization. Recent scholars of capitalism have emphasized and illuminated the commercial and financial side of nineteenth-century capitalism. In some cases, those studies have cast cities and their denizens as the pioneers of a new social, cultural, and economic order.³²¹ Nevertheless, the literature on rural capitalism demonstrates that farming families were a part of capitalist transformation as well.³²² Jonathan Levy's work on mortgages, in particular, demonstrates how central commercial and financial capitalism was to wheat farming.³²³ Much of this literature, particularly what have been called the "new histories of capitalism," has tended to focus

³²¹ Michael Zakim, "The Business Clerk as Social Revolutionary; or, a Labor History of the Nonproducing Classes," *Journal of the Early Republic* 2, no. 4 (Winter 2006): 563–603; Michael Zakim, *Accounting for Capitalism*; Sven Beckert, *The Monied Metropolis: New York City and the Consolidation of the American Bourgeoisie, 1850-1896* (New York: Cambridge University Press, 2001); Brian P. Luskey and Wendy A. Woloson, eds., *Capitalism by Gaslight: Illuminating the Economy of Nineteenth-Century America* (Philadelphia: University of Pennsylvania Press, 2015); Scott A. Sandage, *Born Losers: A History of Failure in America* (Cambridge: Harvard University Press, 2006); Edmund Russell, "Capitalism Matters: How Financial and Technological Innovations Shaped U.S. Telegraphs, 1845-60," *Technology and Culture* 63, no. 1 (January 2022): 31–60.

³²² Kulikoff, *The Agrarian Roots of American Capitalism*; Clark, *The Roots of Rural Capitalism*; Clark, "The Agrarian Context of American Capitalist Development"; Lemon, *The Best Poor Man's Country*.

³²³ Levy, "The Mortgage Worked the Hardest."

on the commercial and financial side of capitalism to the detriment of the industrial side. When technology is discussed within this literature, it is often in the form of “paper technologies” that facilitated the circulation of capital.³²⁴ Writing desks and paper money, rather than steam engines and mechanical reapers, have thus featured as the primary technologies of capitalism.

The study of maintenance and repair offers an opportunity to place productive machinery back at the center of capitalist transformation as well as to make histories of commercial and financial capitalism speak to those of industrial capitalism. Smith and Martello identify this task of elucidating the relationship between the market revolution and the industrial revolution as a foremost question for historians of the nineteenth century.³²⁵ This chapter attempts to contribute to that project. In doing so, it builds upon the work of other scholars of technology who study maintenance, particularly those few who have done so in a nineteenth-century context.³²⁶ The importance of maintenance and repair to farm technological systems demonstrates how central these processes are to industrialization. The extent to which maintenance and repair were a response to the risks of financial capitalism demonstrates how ordinary people built industrial capitalism from

³²⁴ “Forum: Paper Technologies of Capitalism,” *Technology and Culture* 58, no. 2 (April 2017).

³²⁵ Smith and Martello, “Taking Stock of the Industrial Revolution in America,” 188.

³²⁶ Greene, “Success as ‘Failure’: Historians, Engineers, and Maintaining the Erie Canal.”; Busch, “Maintaining Innovators or Innovating Maintainers?: Revolutionaries vs. Reactionaries in the 19th Century Maritime World.”; Belteki, “Caring for the Circle: The Maintenance of Airy Transit Circle, 1851-1861.”; Voskuhl, “Maintaining the State: Civil Service, Engineering, and Class in Pre-Industrial and Industrial Ages, 1713-1914.”; Wickner, “Waste Remediation and Maintenance in the 19th Century Paris Sewer.”; Hounshell, *From the American System to Mass Production*, 91-92, 158-160, gives some brief analysis of the ways in which sewing machine and reaper manufacturers were involved in machine repair. For the place of maintenance studies within the historiography of technology, see Russell and Vinsel, “After Innovation, Turn to Maintenance.”

within the conditions of financial and commercial capitalism.³²⁷ This chapter also demonstrates how maintenance and repair were sites of struggle for control within technological systems, as farmers endeavored to control their machines through maintenance and repair while manufacturers attempted to develop reliable sources of profit. Farming people constructed, and struggled to control, technological systems of grain farming through maintenance.

Agents of Financial Capitalism and Bearers of Risk

When farmers purchased new machines, they not only engaged with commercial and industrial capitalism, but also with financial capitalism. Machine company agents brought financial capitalism, and the risk associated with it, to the farm through the sale of machines on credit. These financial mechanisms of machine purchase allowed many farmers to embrace mechanization and to add machines as components of their technological systems on the farm, but they also opened their technologically capitalized farms up to the significant risk of machine breakage and default.

Farming people became further entrenched in capitalism through the purchase of machines, which usually involved more debt than the purchase of other implements.

While some hand-implement manufacturers sold exclusively for cash, others took

³²⁷ For more on the concept of risk within nineteenth-century commercial and financial capitalism, see Jonathan Levy, *Freaks of Fortune: The Emerging World of Capitalism and Risk in America* (Cambridge: Harvard University Press, 2012).

credit.³²⁸ Conversely, farmers bought machines on credit more often than not, even when companies offered slight price reductions for purchasing in cash, due to their prices. Early mowers and seed drills usually cost near or under \$100—around \$1,900 in today’s dollars.³²⁹ Merchants charged between \$100 and \$150 for reapers and fierce competition in the middle decades of the century kept prices around this level. Later models would push prices up, especially for different types of larger harvesting machines by the 1870s. Threshers were often multiple hundreds of dollars.³³⁰ Early sewing machines also cost more than \$100, but prices eventually declined to an average price closer to \$50 by 1860, with many manufacturers selling for substantially less.³³¹ When farming families purchased new machines, rather than using had tools or relying on the use of others’ machines, they engaged with a substantial new source of debt.

Travelling threshermen also became deeply embroiled in relationships of exchange, credit, and risk when they undertook their operations. As an enterprise that required team labor and expertise, threshermen often entered into these relationships not only with a machine company, but with other travelling threshermen. They bought and sold half-interests in a particular machine before embarking for a threshing season.

³²⁸ “Circular” (Batcheller and Sons Hay Forks, 1867), Box 3, Folder 7, Warshaw Collection, Agriculture, National Museum of American History, Smithsonian Institution; “Note” (Beardsley Scythe Company, 1861, 1871 1851), Box 3, Folder 11, Warshaw Collection, Agriculture, National Museum of American History, Smithsonian Institution.

³²⁹ Inflation Calculator. Consumer Price Index. Date Accessed, February 7, 2022.

<https://www.officialdata.org/us/inflation/1867?amount=100>.

³³⁰ Gates, 286; Fite, 98-107; Winder, 4; Cronon, 315.

³³¹ Connolly, 66; Brandon, 118; “Trade Price List of Standard Singer Sewing Machines” (Chicago, n.d.), Box 18, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/2715/>.

Travelling thresherman Dave Woods recorded the numerous times in which he purchased machines as well as when he bought or sold partial ownership of machines.³³² Other traveling threshermen did the same.³³³ While their sharing of the costs allowed them to share the risks, their frequent exchanges of portions of machine ownership with one another demonstrate both their involvement in relationships of capitalist risk as well as their efforts to ameliorate that risk.

As farming families did not often have substantial amounts of cash available—and they often needed what they had to make mortgage payments—the ability to buy on credit was thus essential to the early expansion of the industry. It was for this reason that Cyrus Hall McCormick Jr. remarked of his father’s sales strategies that the “only way to sell a reaper was for it to pay for itself.”³³⁴ Farmers would purchase machines to use during the harvest and then pay the majority of the cost after the harvest came in, with some of the cash acquired through the sale of their grain, especially wheat. Mechanical reapers also brought the promise of greater profits to pay for their expense, and farm families sometimes planted more wheat when they knew they would have a machine to harvest it.³³⁵ Machines allowed farmers to expand and maximize their production to pay expenses, even though this prospect involved risk.

³³² Dave Wood, *Wisconsin Prairie Diary, 1869-1879* (Wisconsin: Dan Camp Press, 1979), 80, 140, 169-176.

³³³ Wenger, 65; Michie, “Self Doing Naught,” November 27, 1869.

³³⁴ Cyrus McCormick, *The Century of the Reaper* (New York: Houghton Mifflin Company, 1931), 52.

³³⁵ Randle, “Reminiscences,” p. 65.

Reapers were not the only machines that offered greater production in exchange for expenses and debt. Other companies constructed similar systems for other machines involved in the harvest.³³⁶ Families were more likely to purchase sewing machines for cash outright because they were less expensive than field machines. They also did not promise families the possibility of new income to make up for the investment of credit purchasing. Nevertheless, leading companies like Singer offered installment payments as early as the 1850s.³³⁷ Farm families could enter new credit relationships through the purchase of machines.

These credit relationships brought risk to all parties involved. Machines did not always pay for themselves, and farmers did not always make their payments on time. While risk fell most heavily on farmers, manufacturers also encountered risk that might cut into their profits. Much of this risk came in the form of uncollected credits from purchasers. Companies like McCormick's sought to ameliorate manufacturer's risk by encouraging their agents to find creditworthy purchasers.³³⁸ Both manufacturers and their

³³⁶ Stewart H. Holbrook, *Machines of Plenty: Pioneering Agriculture in America* (New York: MacMillan, 1955), 36-40.

³³⁷ Brandon, 118; Cooper, *The Sewing Machine*, 45-54; Don Bissell, *The First Conglomerate: 145 Years of the Singer Sewing Machine Company* (Brunswick: Audenreed Press, 1999), 75-76.

³³⁸ Lauer calls attention to the ways in which nineteenth-century businessmen sought to regulate the uncertain world of credit relationships with the construction of personal moral and economic creditworthiness; "Contract," A. B. Metcalf, 1862, McCormick Mss 5X, Box 1, Folder 19, McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society; "Contract," William F. Carr, 1871, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society; Cyrus Hall McCormick to W. A. Polk, April 24, 1862, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society; Blake and Stowell to Cyrus Hall McCormick, December 7, 1869, McCormick Mss 1A, Box 31, C.H.M. Correspondence.

agents were invested in finding reliable buyers, but the conditions of farming and nineteenth-century capitalism made risk unavoidable.

The risks of debts to farming families, on the other hand, were enough to cause some farming families to avoid or delay purchasing machinery. Laura Ingalls Wilder had Pa, of the *Little House* series, remark that “this giving a mortgage on everything he owns, to buy a two-hundred-dollar machine, and paying ten per cent interest on the debt, will ruin a man.”³³⁹ For this reason, many farming families chose to continue harvesting with hand implements or to rely on borrowing machines from others in these decades. In the latter decades of the century, such a strategy became far less feasible. Nevertheless, many farming families did purchase harvesters and other machines, and took on the risk of doing so, in the middle decades of the century.

Reliance on grain farming was a central aspect of that risk. If bad weather, grasshoppers, or anything else damaged the crop, farmers would struggle to pay their debts. While wheat prices were generally better in the middle decades of the century than they would be later, they were nonetheless prone to fluctuation. Agents wrote to the McCormick company to report on the economic state of farmers in their territories and to alert the company to the prospects of collection after the completion of the harvest. Sometimes they had very little good to report.³⁴⁰ The debts owed to machine companies

³³⁹ Wilder, *These Happy Golden Years*, 197. Laura and her husband would go into debt for the purchase of different machines in later decades, and Laura’s fictionalization of her father did have the advantage of hindsight in his expression of distaste for machine debt. See, Laura Ingalls Wilder, *The First Four Years* (New York: Harper Collins, 1971), 51-52.

³⁴⁰ G. W. Russell, June 2, 1867, McCormick Mss 1A, Box 25, C.H.M. Correspondence; John Edgar, June 3, 1874, McCormick Mss 1A, Box 53, C.H.M. Correspondence.

were also not the only, or even the largest of the farmers' debts. In the Midwest, many farmers had a mortgage on some or all of their land that drew them into relationships of credit and debt as well. Calamities and crop failures could leave farmers without the ability to pay their many creditors.³⁴¹ Risk was thus a factor in the consideration of both farmers and machine companies as both contributed to the industrialization of grain farming.

Machine company agents served as the representatives of debt and capitalist risk as they negotiated the results of credit relationships with farmers. Company agents collected from farm families who, for whatever reason, were behind on payments. McCormick instructed his agents to press hard in their collections from early on. In an 1858 circular he encouraged agents to "use force of law if you have to," but also noted that agents should "use your discretion as to who is worthy of clemency."³⁴² The McCormick company maintained a determined stance on collections but left its agents with the expense and burdens of pursuing them.³⁴³

Yet, in these decades, it was other creditors to whom farmers felt the most obligation to pay. Farmers' other creditors could cause problems for manufacturers when farmers were unable to pay machine debts due to obligations to pay a number of other

³⁴¹ Levy, "The Mortgage Worked the Hardest."

³⁴² William S. McCormick, "Circular," 1858, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

³⁴³ Cyrus Hall McCormick and Leander J. McCormick, "Circular," August 20, 1878, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society. For an example of a letter sent by an agent to a farmer in pursuit of debt collections, see, B. Elmendorf to William D. Guernsey and N. B. Lovering, November 10, 1862, Box 1, Folder 68, Guernsey Family Papers, Huntington Library, San Marino, California.

debts first.³⁴⁴ While the responsibility and expense of collections often fell to agents, rather than the home office, agents appreciated whatever help the company would give them. James Donnelly, a dealer-agent for McCormick, thanked the company for supplying his sub-agents with circulars meant to let farmers know that the company was serious about collections. Donnelly asserted that farmers often thought it was dealers pushing for collections and that the company itself was not pressed for money.³⁴⁵ Another McCormick agent recounted that he would have to wait to collect from one farmer who steadfastly refused to take a mortgage on his land, even if doing so would have allowed him to pay other debts.³⁴⁶ Farmers prioritized keeping their land and independence over fulfilling payment obligations to machine companies.

In these conversations, conflicts, and compromises between farmers and agents, the credit relations of machine adoption took form. Farming people's lives and labors gradually became embedded in capitalist risk, though some avoided the specific risks of machine ownership. It was in this context that farming people produced and maintained new technological systems. Their efforts to do so were shaped by their need to protect their property in crops and machinery as well as by their conflicts with machine companies and their agents.

³⁴⁴ Unknown Author to Cyrus Hall McCormick, October 15, 1864, McCormick Mss 2X, Micro 2021, Reel 60, Frame 219, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society.

³⁴⁵ James Donnelly to Cyrus Hall McCormick, August 26, 1857, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

³⁴⁶ George Mouser to Cyrus Hall McCormick, December 4, 1867, McCormick Mss 1A, Box 25, C.H.M. Correspondence.

Responding to Risk

Breakages were common with field machines, and a broken machine was certainly not going to pay for itself. A broken machine, and the complications it brought to the harvest, jeopardized the family's ability to pay their other debts at the end of the season. Manufacturers and their agents had some interest in the longevity of machines as well, both as an advertisement in their favor as well as a necessity for agents to receive payments on the product of successful harvests. Farming people sought to purchase and use machines in ways that ameliorated risk. They attempted to use old machines, or those they purchased second-hand. They also sought to purchase machines that were long-lasting and would be easily maintained. In doing so, farmers influenced manufacturers and shaped the farm machine industry as consumers out of concern for how machines contributed to their own production.

The efforts of farming people to control risk conflicted with manufacturers' efforts to understand and capitalize on market demand. Farmers mitigated the risk of reaper purchase by buying late enough in the season that they knew with more certainty that the harvest would come in successfully. Agents for the McCormick company complained about this practice in their communications to Chicago. It often resulted in a large rush of orders in the weeks just before, or even during, the harvest that companies

struggled to fulfill.³⁴⁷ One of McCormick's factory men expressed little sympathy for farmers "who have delayed giving orders till the wheat was assured to good harvest [and] are unable to procure machines."³⁴⁸ While this made it difficult for manufactures and their agents to make sales seamlessly, and may have also brought the risk of not getting a machine in time, it was an effective strategy to ameliorate the dangers of incurring further debt with no guarantee of a profitable crop.

The use of old machines also enabled farmers to avoid the risk of machine purchase. Farming people purchased and used machines from other farmers for lower prices and with less debt involved than when dealing with manufacturers. This practice carried over from their use of implements.³⁴⁹ They could also purchase sewing machines second-hand.³⁵⁰ In fact, Singer instituted a policy of taking back old machines for a discount on a new model and, in an effort to prevent old machines from being resold, destroyed the old machines—preferring to maintain monopoly and scarcity at the expense of short-term profits off the sale of repaired machines.³⁵¹ The company recognized the second-hand market as a threat to its long-term profits. Purchasing machines from within one's farming community could be a way for farmers to avoid the risks of purchasing a new machine on credit but was a threat to manufacturers' profits.

³⁴⁷ George Mouser to Cyrus Hall McCormick, June 5, 1867, McCormick Mss 1A, Box 25, C.H.M. Correspondence.

³⁴⁸ Charles Colahan to Cyrus Hall McCormick, May 23, 1878, McCormick Mss 1A, Box 71, C.H.M. Correspondence.

³⁴⁹ Lorenzo Dow Brown, "Journal Transcriptions" August 18, 1871, Box 3, Folder 9, p. 51; Samson Howell, "Diary," November 27, 1868; Brackett, "Journals, Volume Three," July 30, 1872, p. 142.

³⁵⁰ Peter Norbeck and George Norbeck, *The Norbecks of South Dakota*, 60.

³⁵¹ Brandon, 118-119.

Manufacturers claimed to meet demands for long-lasting machines in their advertising and sold their machines as simpler and more durable than their competition—and therefore easier to maintain. Sewing machine manufacturers Grover and Baker championed their design of a portable sewing machine box as a handy platform to position their machine upon for easy repairs.³⁵² Sewing machine manufacturers were more likely to use testimonials of long-time users to assert their machines as so durable that they would need few, if any, repairs, even over years of use.³⁵³ Field machine manufacturers addressed maintenance more directly and emphasized their machines' maintainability. An 1849 advertisement for Cook's Reaper stated, "The sickle is composed of several pieces, which are screwed fast to a bar of iron; therefore if one piece should be broken, it may be taken out and another put in its place in less than five minutes."³⁵⁴ An 1850 advertisement for Hussey's reaper claimed that it was easier to store than the McCormick due to its size and simplicity.³⁵⁵ It would thus fit better into farming peoples' maintenance practices. The makers of other machines advertised theirs as such as well. The makers of the Richmond Grain Drill sold it as "easier to repair than any other drill," because a farmer could simply remove the front shield, "so that the broken piece can be removed and another put in its place without disturbing the other

³⁵² Cooper, *The Sewing Machine*, 38.

³⁵³ Advertisements. *Godey's Lady's Book*, June 1867, vol. 74, pg. 571; Gilbert Pratt. *Godey's Lady's Book*, December 1868, vol. 77, pg. 551; Mrs. M. L. Peck. *Godey's Lady's Book*, March 1870, vol. 80, pg. 293; Gilbert Pratt. "Our Arm Chair-Can Any One Beat This?" *Peterson's*, December 1868, 478; "A Challenge from a Lady." *Peterson's*, January 1869, 88; "Mrs. Secretary McCulloch's Report." *Peterson's*, February 1869, 168. Editor's Table. "Ten Years" *Peterson's*, May 1869, 404; Editor's Table. "Wheeler and Wilson." *Peterson's*, May 1870, 400; Parton, *History of the Sewing Machine*, 22.

³⁵⁴ "Cook's Reaper." *Prairie Farmer*, October 1848, 221.

³⁵⁵ "Hussey's Reaper." *Prairie Farmer*, March 1850, 75.

part.”³⁵⁶ The Walter A. Wood company made similar claims for their mowers and reapers.³⁵⁷ Machine manufacturers understood that farmers wanted a machine they could take care of themselves.

The commentary offered by farm press editors and contributors also valorized machine simplicity and maintainability. One contributor to the *Ohio Cultivator* argued against the adoption of self-raking reapers on the grounds that their “cumbersome form [sic]” would be difficult to store and maintain.³⁵⁸ A contributor to the *Canadian Agriculturalist* in 1861 likewise understood simplicity to be a virtue and recommended that farmers look for simplicity because “a simple machine is cheaply bought, easily managed, and not easily deranged, and quickly restored to repair.”³⁵⁹ Another noted that simplicity itself, however, would have to be invented, and may take some time to arrive in the fields. He wrote of an English reaper: “the machine would require many improvements, especially in simplification, before any ploughman would be able to work it, or an ordinary blacksmith repair any part which might give way.”³⁶⁰ Even in the 1870s, the winners of field machine trials sometimes did so on the virtue of their relative simplicity compared to other machines. The farmers who judged those trials thus demonstrated their desire for maintainable machines.³⁶¹ Farmers as consumers, and

³⁵⁶ “Richmond Grain Drill.”

³⁵⁷ “Walter A. Wood Mowing and Reaping Machine Co. Circular for the Year 1872,” 1872, Hagley Library, Trade Catalogs. 15.

³⁵⁸ “A Chapter on Mowing Machines.” *Ohio Cultivator*, May 15, 1854, 151.

³⁵⁹ “Farm Implements and Machinery.” *Canadian Agriculturalist*, January 16, 1861, 41.

³⁶⁰ “Reaping Machines.” *Canadian Agriculturalist*, August 16, 1861, 485-487.

³⁶¹ “Victory over the Marsh at the Farm of Mr. Joseph Luckey, Jerseyville, Ill, June 29th.” *Grange Advance*, July 20, 1875, 7. For other advertisements that lauded the simplicity of their machines, see, “The Nichols Shepard and Co. Vibrator.” *Grange Advance*, July 26, 1876, 3.

machine companies as producers and advertisers, thus both shaped the mid-century farm machine industry towards maintainability.

Yet farming people asserted more control over their technological systems when they could delay the necessity of purchasing new machines by maintaining their current ones. When farmers did the work of maintenance, they acted more as producers than as consumers. In 1867, a McCormick company agent observed that many farmers in his territory had simply “fixed up their old machines” instead of buying new ones.³⁶² These farmers avoided delving even further into credit relationships and debt by making further use of their machines. Using the machine knowledge that they built over the middle decades of the century, farming people cultivated practices of routine machine maintenance that protected them from the precarities of financial capitalism but also, in the process, produced and reproduced new technological systems on the farm.

Maintenance Practices

Farmers’ maintenance practices were a response to the risks of farming under American financial capitalism, but they also contributed to the development of industrial capitalism on the farm. The mechanical labor required to keep machines moving and producing became a routine part of farm life. Farmers also became consumers of other devices designed to help them do so. Maintenance responsibilities fell largely to farming

³⁶² B. Sawyer to Cyrus Hall McCormick, August 12, 1867, McCormick Mss 1A, Box 25, C.H.M. Correspondence.

people, with some assistance from manufacturers and their agents. But while farmers' priorities lay with keeping their machines around and functioning for long periods of time, the priorities of manufacturers and their agents lay in making sales and collecting payments. These priorities sometimes complimented one another but often led to conflict between farmers and manufacturers. Ultimately, it was farming people themselves who did the work of making machines work year in and year out, while manufacturers were more concerned with selling machines—and sometimes parts—than in maintaining them. This burden, however, left farming people in a position to assert control over the technological systems on their farms through maintenance with some autonomy.

Maintenance began as soon as an agent or farmer brought a machine to the field. Agents participated in the initial set-up process as a part of securing sales, but manufacturers were often still in the process of developing their organizational structures in these decades, so their help setting up could be limited. Manufacturers first assigned sales agents to set up machines in the fields of farmers who purchased them. In the 1840s, Cyrus McCormick sent out members of his family, including his younger brothers, to set up the earliest machines he manufactured in Virginia.³⁶³ In subsequent decades, McCormick wrote this responsibility into agents' contracts.³⁶⁴ Other companies had

³⁶³ Charles Young to Cyrus Hall McCormick, March 22, 1855, McCormick Mss 1A, Box 7, C.H.M. Correspondence.

³⁶⁴ "Contract," A. B. Metcalf, 1862, McCormick Mss 5X, Box 1, Folder 19, McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society; "Contract," William F. Carr, 1871, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society; "Contract," October 1, 1871, McCormick Mss 5X, Box 1, Folder 32, McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society.

similar expectations of their agents.³⁶⁵ Setting up machines required knowledge. Western McCormick agent D. W. Pratt wrote to the home office of his difficulty in getting new sub-agents familiar enough with the machines to help farmers set them up in the fields.³⁶⁶ Agents for the manufacturers of other types of machines were also tasked with setting machines up. It was a greater task to set up a threshing machine, because such machines were larger and often more complicated than reapers and mowers. Mitchell Y. Jackson, a Minnesota farmer who also worked for a farm implement dealer, stayed over-night on some of the farms for which he set up machines as part of a multi-day effort.³⁶⁷

Smaller field machines and household machines also had to be set up.

Manufacturer's agents often participated in this process as well, as sewing machine company agents came to farm households to set up machines.³⁶⁸ Sewing machine trade literature communicated machine knowledge to both company agents and customers. These catalogs and instruction books often included instructions for the initial set-up and use of machines.³⁶⁹ Agents could supply the initial knowledge necessary to set machines up. Some of those agents were women. The neighbor of Minnesota farm woman Ann Brackett for instance, placed an order for a sewing machine for her in 1871. This

³⁶⁵ Gue, July 2, 1855, 122.

³⁶⁶ D. W. Pratt to Cyrus Hall McCormick, August 19, 1876, McCormick Mss 1A, Box 63, C.H.M. Correspondence.

³⁶⁷ Brown and Jackson, 94.

³⁶⁸ Lorenzo Dow Brown, "Journal Transcriptions," July 7 20-12, 1871, Box 3, Folder 10, p 44.

³⁶⁹ "The New Domestic Family and Manufacturing Sewing Machines" (New York, n.d.), Box 1, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/0810/>; "Shaw and Clark Sewing Machine Company. Family Sewing Machines" (Biddeford, ME, 1864), Box 2, Folder 8, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/0746/>.

neighbor was likely acting as a company agent and thus helped teach Brackett about the machine and set it up initially.³⁷⁰ Setting up machines and ensuring they run well, at least at first, was a way for company agents to ensure that the purchase would be a successful one and to ameliorate the risks of machine failure or lack of payment.

Farm families and neighbors also participated in the set-up process as it became a recurring part of machine use year after year. Even if a company agent set up a machine immediately after purchase, farming people had to handle the set-up process themselves in subsequent harvest seasons. An 1860 article in the *Prairie Farmer* recommended that farmers look over their machines and do any necessary repairs at least a week before the harvest.³⁷¹ Farmers often spent time getting their reapers and mowers “rigged” or “tinkering” with them in the days before their use.³⁷² One farmer, who often did repairs to his machine in the weeks before starting his harvest, “tinkered at [the] old machine” for nearly three days getting it ready to harvest.³⁷³ The set-up process was not a one-time event and farming people themselves took on the bulk of the responsibility for it as they produced this initial phase in systems of mechanized harvesting on a recurring basis.

³⁷⁰ Brackett, “Journals, Volume Three,” June 3, 1871, p. 67; Brackett, “Journals, Volume Three,” June 13, 1871, p. 69.

³⁷¹ “About Reapers and Mowers for 1860.” *Prairie Farmer*, July 1860, 5.

³⁷² Samson Howell, “Diary, 1868-1869,” July 21, 1868; Cummins, “Diary,” July 2nd, 1863, Reel 1, Frame 723; Cummins, “Diary,” July 14, 1870, Reel 1, Frame 1220; Rollins, “Diary,” July 5, 1871, Reel 2; Rollins, “Diary,” August 6, 1872, Reel 2; Rollins, “Diary,” July 27-28, 1876, Reel 3; Rollins, “Diary,” July 30, 1873, Reel 2; Wilfred Vinton, “Diary” (1867-1870), August 12, 1867, Lydia Vinton and family diaries, Minnesota Historical Society, <http://www2.mnhs.org/library/findaids/01313.xml?return=brand%3Dfindaids%26q%3Dfarm%26type%5B%5D%3DManuscripts%2520collection%26yearrange%3D1830-1900>.

³⁷³ John Campbell Bailey, “Diary” (1871), July 6, 1871, p. 34, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum; John Campbell Bailey, “Diary” (1877), July 18-20, 1877, p. 34, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum.

Other farmers sought help within their communities and systems of labor organization. Hade Wells, a hired worker in the employ of Calvin Fletcher of Indiana set up Fletcher's machines in the mid-1860s before leading most of those machine harvesting and threshing processes.³⁷⁴ In 1873, Minnesota farmer Andrew Peterson identified a neighbor who came over and "helped me to assemble the mower" when he first purchased one.³⁷⁵ This neighbor also owned a threshing machine that Peterson used later that year in exchange for Peterson's own labor on the machine while threshing for others.³⁷⁶ Indiana farmer James Swan also set up to bring it to a neighbor's farm to share both the machine and work in 1874.³⁷⁷ John Campbell Bailey repaired a reaper after retrieving it from a neighbor's farm where it had been shared before bringing it home in preparation for the harvest.³⁷⁸ In these decades, farming people relied on neighbors, kin, and hired hands to set-up their machines as much, if not more, than they relied on manufacturers' agents.

The rural people who ran traveling threshing operations often took on the task of setting up large and complicated threshing machines, with some help from the farmers whose grain they were threshing.³⁷⁹ While the relationship between agent and customer

³⁷⁴ Fletcher, *Diary*, vol. 9, (1865-1866), March 20, 1865, 101.

³⁷⁵ Peterson, "Diary," July 7, 1873, Reel 2, pg. 282.

³⁷⁶ Peterson, "Diary," September 8-13, 1873, Reel 2, p. 367.

³⁷⁷ James Swan, "Diary" (1874), July 6, 1874, M 0404, Box 2, Folder 4, Ione Swan Paugh Collection, 1872-1971, Indiana Historical Society.

³⁷⁸ John Campbell Bailey, "Diary" (1875), July 29-30, 1875, p. 33, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum.

³⁷⁹ Olds, "1870 Diary," September 30, 1870; Stein, "Diary," August 18, 1876; Stein, "Diary," August 28, 1876; Buttles, September 18, 1860, Reel 1; Buttles, September 3, 1864, Reel 1; Buttles, September 6, 1864, Reel 1; Buttles, September 1, 1867, Reel 2; Buttles, September 4, 1871, Reel 2.

often brought forth the initial set-up process, it was relationships between farmers within their own communities that conditioned the set-up process year after year.

Keeping machines clean was also a recurring maintenance practice that protected farmers' investments and produced mechanized agriculture. Sewing machine trade catalogs often included notes about the importance of, and instructions for, cleaning machines.³⁸⁰ Sometimes, however, farmers went above the recommendations of manufacturers to keep their machines clean. Indiana farmer and mechanic, Lorenzo Dow Brown, went as far as to disassemble a reaper to thoroughly clean all parts of it in 1863.³⁸¹ Doing so required not only deep machine knowledge, but a willingness to interfere with, and even alter, the inner workings of the machine for the sake of maintenance.

Oiling machines was just as essential of a maintenance task for the production of mechanized farming. The first thing that Kansas homesteader, George Hildt, did before both the first and second runs of his new mower in 1857 was to thoroughly oil it. Hamlin Garland also described oiling as an important part of using a mechanical reaper or thresher.³⁸² Oiling kept the metal parts of the machine that would slide against each other when in motion from getting stuck and breaking. The judges of reaper and mower trials

³⁸⁰ "Instruction Book for the Howe Sewing Machine Step Feed" (1867), Box 1, Folder 2, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.si.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/0863/>; "Instructions for Using Wheeler and Wilson's New Family Sewing Machines: No. 8" (New York, 1876), Box 2, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.si.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/0755/>.

³⁸¹ Lorenzo Dow Brown, "Journal Transcriptions," July 4, 1863, Box 3, Folder 3, p. 20

³⁸² Hildt, (July 30-August 4, 1857), 280; Garland, *Son of the Middle Border*, 52.

noted how and when contestants could oil the machines in competition, knowing that it was an essential component of their performance.³⁸³ Even farmers who did not own machines might have to oil machines when they used them. For instance, Mitchell Y. Jackson lent his threshing machine out in October 1860, and the stipulation that the borrowers must supply oil for the machine was part of the deal. Oiling was also stressed in trade literature for sewing machines. One pamphlet stated that the machine “should be oiled often and never, on any account, be allowed to run dry.”³⁸⁴ Other manufacturers shipped their machines with oil cans so that buyers could oil machines immediately.³⁸⁵ Oiling was thus an essential part of the production and reproduction of systems of mechanized agriculture in farmers’ daily lives.

While the cultivation of maintenance practices allowed farmers to use machines with some autonomy from manufacturers, they relied on the manufacturers of other goods for some maintenance tasks. The necessity of oiling also added a new product that farmers had to purchase in order to maintain and reproduce their technological systems and thus brought industrial capitalism further into farm life. Farming people applied oil or other solutions to some non-machine implements, including wagons, plows, and

³⁸³ “Great Field Trial of Reapers and Mowers in Minnesota.” *Prairie Farmer*, September 7, 1867, 145.

³⁸⁴ “Directions” (Curtis and Simonds: Fitchburg, Massachusetts, n.d.), Box 2, Folder 3, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries.

<https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/0720/>; “The ‘Domestic’ Sewing Machine Is the Best of All” (New York, n.d.), Box 1, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries.

<https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/0808/>.

³⁸⁵ “Illustrated Price List of the American Sewing Machine” (Philadelphia, 1873), Box 1, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/0790/>

harnesses. The oiling of machines involved more moving parts and the machine oil used for it was something that had to be purchased.³⁸⁶ They were thus, in their efforts to ameliorate the risks of the market by maintaining their machines, drawn into other markets for the supplemental goods needed to do so.³⁸⁷ Farming people thus brought industrial capitalism to their farms as they became consumers of new products in order to remain producers of others.

Many farmers also painted their machines to protect them from the elements. While painting machines did, as cultural historian John Kasson has observed, allow farmers to adorn their machines with meaning as well as color, it also served an important material purpose as an act of maintenance.³⁸⁸ Paint limited the exposure of wooden parts to the elements. Painting was a maintenance practice for agricultural implements as well. Lorenzo Dow Brown frequently painted his scythes, cultivators, and wagons.³⁸⁹ He carried this practice into his use of machines by painting a reaper red.³⁹⁰ Farmers tended to paint machines that they kept around for a long time as well. In 1874, a McCormick

³⁸⁶ Lorenzo Dow Brown, "Journal Transcriptions," November 21, 1870, Box 3, Folder 9, p. 71; "To Keep Plows from Rusting." *Prairie Farmer*, September 1849, 291; "Greasing Wheels." *Farmers' Union*, January 6, 1872, 3.

³⁸⁷ Clarence D. Vawter, "Diary" (1866), MS 957, Clarence D. Vawter papers, 1848-1913, Kansas State Archives; Lorenzo Dow Brown, "Journal Transcriptions," January 18, 1872, Box 3, Folder 11, p. 6; Lorenzo Dow Brown, "Journal Transcriptions," November 22, 1878, Box 4, Folder 4, p. 112; "Machine Oils, of all kinds, at Poole's Drug Store." *Grange Advance*, July 12, 1876, 11; Michie, "Self Doing Naught," (August 22, 1868); Dave Wood, *Wisconsin Prairie Diary, 1869-1879* (Wisconsin: Dan Camp Press, 1979).

³⁸⁸ Kasson, 139-180.

³⁸⁹ Lorenzo Dow Brown, "Journal Transcriptions," January 2, 1865, Box 3, Folder 5, p. 1; Lorenzo Dow Brown, "Journal Transcriptions," March 16, 1865, Box 3, Folder 5, p. 9; Lorenzo Dow Brown, "Journal Transcriptions," June 27, 1865, Box 3, Folder 5, p. 28; Lorenzo Dow Brown, "Journal Transcriptions," July 10, 1866, Box 3, Folder 6, p. 24.

³⁹⁰ Lorenzo Dow Brown, "Journal Transcriptions," July 8, 1876, Box 4, Folder 2, p. 57.

agent described a machine that one farmer had used since the 1850s that was also painted red.³⁹¹ Maintenance tasks like painting allowed farming people to turn machines into parts of ongoing technological systems on the farm.

Machines also required effective storage in order to last. An article in the *Prairie Farmer* listed the prevention of rust among the principal reasons that farmers should store their machines properly.³⁹² Storage was particularly important for field machines that would be used seasonally and then left alone for months. The storage process was the other side of the set-up process, as farmers took machines out of storage and put them into working shape only to put them away again when the reaping, threshing, or mowing of the season was done. Storage practices were somewhat consistent with those for hand implements, as even cradles and flails required safe storage space.³⁹³ Yet machine storage required more space and attention for more expensive and complicated items.

Some farmers eventually built designated machine sheds but making space in a barn or in other shared spaces was more common in the middle decades of the century.³⁹⁴ Perhaps part of the reason it took so long was that Howell, like Courtland Olds in 1870, had to clear out space in order to make room for a reaper. Children remained involved in machine maintenance practices as well as in machine use, and often assisted in the clearing of space for machines.³⁹⁵ Other farmers made space by disassembling the

³⁹¹ John B. Erb, July 3, 1874, McCormick Mss 1A, Box 53, C.H.M. Correspondence.

³⁹² "Take Care of the Implements." *Prairie Farmer*, March 22, 1873, 89.

³⁹³ *Prairie Farmer*, September 1841, 67.

³⁹⁴ Henry A. Griswold, "Diary, January 1872-December 1879" (1872-1879), August 1, 1874, p. 64.

³⁹⁵ "Valuable Experience in Drilling in Corn." *Prairie Farmer*, January 27, 1872, 26; Samson Howell, "Diary" September 27, 1869; John Campbell Bailey, "Diary" (1871), August 16, 1871, p. 41; Henry A.

machine so that it would take up less space.³⁹⁶ If farmers did disassemble their machines, re-assembly became a part of the set-up process the next year.³⁹⁷ Farm families as a whole created the storage practices that allowed them to mitigate the risks of machine use and re-produce their technological systems each year.

Farming people had to accommodate the storage needs of larger threshers and, during threshing season, threshermen had to find places for their machines to rest while on the road. Threshermen stored their machines wherever they could find space while travelling. They often stored machines in the barns or fields of the farmers that they threshed for.³⁹⁸ Finding this shelter was critical to keeping machines protected from the elements. Anson Buttles noted one narrow escape when his team pulled the thresher into a farmer's barn: "just as we got it in the barn there came along a hard shower."³⁹⁹ Nevertheless, at the end of the season, threshers usually stored their machines in a workshop or other designated place.⁴⁰⁰

Household machines had their own storage needs as well. Sewing machines required less space for their storage, but families had to find that space within the house. Nevertheless, farming families took care to store them as well. One sewing machine company sold a storage box with their machine for "protection to the Machine when not

Griswold, "Diary, January 1862-December 1861," August 26, 1868, p 158; Olds, "1870 Diary," September 30, 1870.

³⁹⁶ Buttles, October 9, 1869, Reel 2; See also, G. W. Carpenter. "Strong, Well Made, and Does Good Work." *Grange Advance*, March 23, 1875, 3.

³⁹⁷ Henry A. Griswold, "Diary, January 1862-December 1871," June 12, 1871, p. 225.

³⁹⁸ Buttles, October 18, 1866, Reel 2; Buttles, September 26, 1867, Reel 2.

³⁹⁹ Buttles, September 12, 1874, Reel 2.

⁴⁰⁰ Buttles, October 9, 1869, Reel 2; Michie, "Self Doing Naught," December 31, 1870.

in use.”⁴⁰¹ Other companies sold similar storage boxes.⁴⁰² Such products may have been useful and constituted another example of a consumer product that families had to purchase in order to protect the tools they relied on as producers, though it was farm families themselves who had to create the storage practices that would protect their machines in the home.

Manufacturers and dealers were also involved in practices of machine storage when they sold and distributed machines, but their purposes in contributing to this task of maintenance were rooted in their efforts to sell machines. Storage, and its associated infrastructure, was a necessary part of distribution. An 1849 article in the *Prairie Farmer* noted that farm machines would not become common in Illinois while the region still lacked “agents and agricultural warehouses.”⁴⁰³ In later decades, Illinois would lack neither the manpower to fuel the distribution system, nor the physical space necessary for machine storage and distribution.⁴⁰⁴ A lack of storage space could seriously hinder companies’ distribution systems. A McCormick agent instructed the factory not to send any machines yet to his territory because local agents did not yet have space to store them. He also mentioned that what little space they did have was “in a poor shape to deal with fire should it occur.”⁴⁰⁵ It was not just new inventory that pressed agents for space.

⁴⁰¹ “The Singer Sewing Machines” (Brooklyn, NY, n.d.), Box 18, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries.

<https://www.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/2676/>.

⁴⁰² Cooper, *The Sewing Machine*, 38.

⁴⁰³ “Relating to Machines.” *Prairie Farmer*, September 1849, 281.

⁴⁰⁴ “The Descriptive Catalogue of the Albany Agricultural Warehouse.” *Prairie Farmer*, February 1848, 65.

⁴⁰⁵ G. W. Russell to Cyrus Hall McCormick, March 4, 1867, McCormick Mss 1A, Box 25, C.H.M. Correspondence.

Unsold holdovers from previous seasons took up space and often needed repairs before final sale.⁴⁰⁶ All of this would have occurred within a dealer's warehouse or an agent's shop.

The transportation of machines also required care and maintenance in the context of sales, and manufacturers conflicted with their own agents over the risks and responsibilities involved in transportation. The McCormick company sent machines out to its agents by the carload over railroads. These same technologies and institutions of developmental capitalism that helped spread information about machines also carried the machines themselves. Agents were also often responsible for sending these loads of machines on to their various sub-agents for further distribution.⁴⁰⁷ Transportation came with its own risks, however, and did not always go smoothly. Machines could be damaged in transit.⁴⁰⁸ Threshing machines were so large that different large pieces of the full machine might be shipped, and even sold, separately. Transportation brought risks that agents often had to deal with.

The cost of shipping was another concern for agents. The question of who was to pay the freight costs for each machine sold was one of consternation between the McCormick home office and its agents. McCormick company agent contracts asserted

⁴⁰⁶ H. J. Prier, "Preliminary Report of the State of Indiana," 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence; I. N. Van Hoesen to Cyrus Hall McCormick, June 26, 1872, McCormick Mss 1A, Box 47, C.H.M. Correspondence.

⁴⁰⁷ J. H. Osborne to Cyrus Hall McCormick, May 13, 1867, McCormick Mss 1A, Box 25, C.H.M. Correspondence.

⁴⁰⁸ Porter and Sherman to S. Drulard, March 14, 1861, Box 3, Folder 13, Warshaw Collection, Agriculture, National Museum of American History, Smithsonian Institution.

that it was the agent's responsibility to either get the customer to pay the freight, or to do so himself.⁴⁰⁹ Sometimes agents did manage to get customers to pay that price, as Benjamin Gue remembered paying the shipping cost when he purchased his reaper in 1855.⁴¹⁰ In other instances, agents were left with large freight costs to bear themselves, and they complained to the home office about this burden.⁴¹¹ Whether agents were successful in passing freights onto customers or not, the McCormick company was largely successful in passing the costs and risks of machine transportation onto its agents.

Farming people had to transport machines as well, though they did so more locally and in the context of their social systems of labor organization. When using machines, and especially when sharing machines, the labor of careful transportation became a part of farm labor. Transporting machines across different distances became a common part of machine work for hired hands and farmers alike.⁴¹² Farming people often encountered difficulty when moving, sharing, and storing threshers on multiple farms,

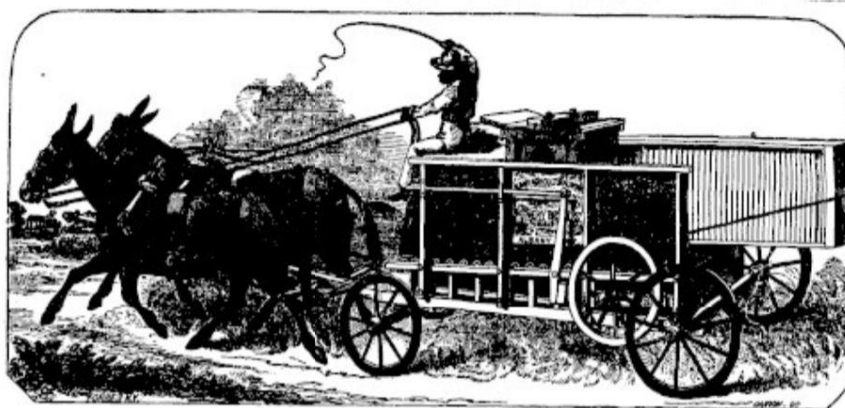
⁴⁰⁹ Op. cit. "Contract," A. B. Metcalf, 1862, McCormick Mss 5X, Box 1, Folder 19, McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society; "Contract," William F. Carr, 1871, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society; "Contract," October 1, 1871, McCormick Mss 5X, Box 1, Folder 32, McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society.

⁴¹⁰ Gue, July 2, 1855, 128.

⁴¹¹ B. Sawyer to Cyrus Hall McCormick, June 3, 1867, McCormick Mss 1A, Box 25, C.H.M. Correspondence.

⁴¹² Calvin Fletcher, *Diary*, vol. 8, (1863-1864), June 24, 1863, 181; Fletcher, *Diary*, vol. 8, (1863-1864), August 1, 1863, 188; Fletcher, *Diary*, vol. 8, (1863-1864), July 21, 1864, 431. For other farmers transporting threshing machines, see, John Campbell Bailey, "Diary" (1874), September 3, 1874, p. 38, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum; Harman Cotterman, "Diary" (1875-1876), September 8, 1875, M 1290, Box 1, Folder 1, Harman and Sarah Cotterman Diaries, 1875-1933, Indiana Historical Society; Cummins, "Diary," September 4, 1863, Reel 1, Frame 734; Brackett, "Journals, Volume One," September 9, 1863, p. 2; Brackett, "Journals, Volume One," September 20, 1864, p. 66.

especially if they encountered any conflict in the process. In 1871, a neighbor threw a wrench into Cummins' threshing plans by refusing to take the machine when it came to be his turn. This meant wasted labor on the part of the humans and animals who had hauled the machine there and may have raised the question of where to store the machine for the day. Traveling threshermen confronted these concerns regularly. They also had to take care in how they loaded their machines for transport.⁴¹³ Farmers lost time when threshing machines arrived late or not at all.⁴¹⁴ The transportation of threshing machines, and the care of them during transport, was a central part of the machine threshing process.



EMERY'S TWO HORSE POWER AND THRESHER, As seen moving from place to place

Figure 9: A Thresher depicted in transit. Manufacturers knew farmers and threshermen would prioritize mobility in these machines that they often shared or hired out. "Emery's Two-Horse Power and Thresher." Prairie Farmer, August 19, 1858, p. 135.

Yet while reapers and mowers may have been smaller than threshers, they also required care and knowledge to transport safely from farm to farm. One way to do so was

⁴¹³ Michie, "Self Doing Naught," August 3, 1870; See also, Buttles, March 13, 1858, Reel 1; Buttles, September 3, 1864, Reel 1; Buttles, September 6, 1864, Reel 1.

⁴¹⁴ Bailey, "Diary" (1870), August 5, 1870, p. 39. Bailey, "Diary" (1871), August 16, 1871, p. 40.

to partially disassemble the machine in order to haul it. This is what Kansas homesteader George Hildt did in 1857 when he recorded that “the machine was taken apart and loaded in a wagon and everything got ready to start tomorrow.”⁴¹⁵ Other farmers simply recorded frequent instances of bringing reapers and mowers from place to place in the course of sharing machines and hiring them out.⁴¹⁶ The task of moving reapers and mowers from place-to-place involved caring for them along the way.

Sewing machines were even smaller than reapers and mowers but transporting them was perhaps even more complicated. The transportation of a sewing machine from house to house was rare because they were not built to be moved the way that field machines were. Nevertheless, some women did transport sewing machines when assisting one another with sewing. Rachel Bowman Cormany did so with the help of her brother-in-law’s carriage. The dangers of sewing machine transport were shown, however, when a frightened horse nearly overturned their carriage.⁴¹⁷ Cormany also reported damage to a sewing machine treadle after transport on another occasion.⁴¹⁸ Transporting machines was a central part of reciprocal practices of machine use but was not without risk.

⁴¹⁵ Hildt, September 12, 1857, 287.

⁴¹⁶ James Swan, “1874 Diary,” July 12, 1874, Box 2, Folder 4; James Swan, “1874 Diary,” July 21-23, 1874, Box 2, Folder 4; Lorenzo Dow Brown, “Journal Transcriptions,” July 25, 1877, Box 4, Folder 3, pg. 63; Bailey, “Diary” (1867), July 29, 1867, p. 22; Bailey, “Diary” (1867), September 21, 1867, 28; Bailey, “Diary” (1867), September 30, 1867, p. 29; John Campbell Bailey, “Diary” (1869), November 6, 1869, p. 50, MS-32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum; Bailey, “Diary” (1870), July 14, 1870, p. 36; Brackett, “Journals, Volume One,” August 19, 1865, p. 118.

⁴¹⁷ Cormany, (August 29, 1864), p. 448.

⁴¹⁸ Cormany, (December 31, 1864), p. 499.

The replacement and care of sickle and cradle knives was a prime maintenance concern even before the widespread adoption of mowers and reapers.⁴¹⁹ Farming people sharpened their own sickles and scythe blades and also assisted neighbors in doing so.⁴²⁰ Iowa farm boy, Hugh Orchard, remembered a story that his father told him that reinforced the importance of sickle sharpening. Orchard's father claimed to have hired a man who spent all day sharpening his sickle rather than harvesting. When chastised by his employer, the hired man would only reply, "there is nothing lost by whettin." The hired man did not begin cutting until nearly nightfall, but when he did, he cut perfectly and faster than seemed possible.⁴²¹ While this story may have had more moral than truth to it, it illustrates the importance of sharpening as a part of practices of implement maintenance.

Mowers and reapers required the "grinding" or sharpening of their sickle sections or knives as well. Sharpening the blades of either implements or machines often involved the use of a grindstone against which the blade would be pressed.⁴²² Farming people sharpened the sickles and blades of their mowers and reapers in preparation for their use and as a general act of ongoing maintenance.⁴²³ Whether farming people did so as a part

⁴¹⁹ "To Keep Plows from Rusting." *Prairie Farmer*, September 1849, 291.

⁴²⁰ Peterson, "Diary," August 28, 1861, Reel 2, p. 99; Lorenzo Dow Brown, "Journal Transcriptions," August 12, 1871, Box 3, Folder 10, p. 49; Buttles, August 11, 1863, Reel 1; Buttles, August 1, 1864.

⁴²¹ Hugh Orchard, *Old Orchard Farm* (Ames: Iowa State College Press, 1952), 26-28.

⁴²² Even these grindstones required some maintenance of their own to be kept running optimally. See, "Putting Grind Stones in Order." *Farmers' Union*, July 18, 1872, 5.

⁴²³ Lorenzo Dow Brown, "Journal Transcriptions," July 8, 1863, Box 3, Folder 3, p. 20; Lorenzo Dow Brown, "Journal Transcriptions," August 12, 1875, Box 4, Folder 1, p. 67; Ferguson, "Diary," June 27, 1873; Burba, 416; Buttles, October 29, 1866, Reel 2; Levi N. Countryman, "Diary Transcript, Volume Two" (November 1859-October 1861), August 12, 1859, P2591, Box 2, Levi N. Countryman and family

of the set-up process or during the winter, and whether they did so for their own machines or those of others, periodic sickle sharpening allowed them to maintain their machines and their systems of mechanized farming.

Farmers supplemented their maintenance practices with manufactured repair tools. Sickle grinders originated in the middle decades of the nineteenth century and allowed for the sharpening of machine blades faster than on a grindstone. They were also smaller and more portable. Early advertisements for “Sanford’s Grinder” and “the Chicago” grinder, much like the early advertisements for farm machines, gave information on how to use the devices.⁴²⁴ The manufacturers and vendors of these devices also adopted the agency model, and ran solicitations for “responsible and active men in every town and county” to serve as agents, opening another opportunity for rural people to join the ranks of the business classes through their knowledge of machines.⁴²⁵ Farming people may have encountered these devices and their agents at the same county and state fairs at which they would have seen machines.⁴²⁶ Such sharpening devices were another consumer product through which farming people protected their tools of production and further brought industrial capitalism to the farm.

papers, Minnesota Historical Society; Countryman, “Diary,” July 23, 1860; Bailey, “Diary” (1867), September 3, 1867, p. 26.

⁴²⁴ “Every Farmer Should Use Palmer’s Emery Grinder.” *Prairie Farmer*, April 3, 1869, 110; “Sanford’s Reciprocating Grinder.” *Prairie Farmer*, April 17, 1869, 126; “The Chicago Reciprocating Grinder.” *Prairie Farmer*, January 22, 1870, 21; “The Chicago Reciprocal Sickle Grinder Co.” *Prairie Farmer*, March 26, 1870, 95.

⁴²⁵ “The Chicago Reciprocal Sickle Grinder Co.” *Prairie Farmer*, May 12, 1870, 79; “Agents Wanted.” *Prairie Farmer*, April 17, 1869, 125.

⁴²⁶ “Illinois State Fair.” *Prairie Farmer*, September 28, 1872, 305.



Figure 10: "The Chicago Reciprocal Sickle Grinder Co." *Prairie Farmer*, March 26, 1870, p. 95.

Machine manufacturers and their agents took an interest in the maintenance, or rather, in the replacement of sickle blades because it was another source of sales and potential profit. Blades quickly became a part that many machine users needed replaced regularly. In the 1850s and 1860s, the McCormick company began getting many requests for sickle replacements for reapers and mowers, often for older machines.⁴²⁷ McCormick sometimes failed to provide adequate replacements.⁴²⁸ In one instance, the problem that an agent reported was not that the knives failed to stand up to the work of the harvest, but rather that they failed to stand up to farmers' usual practices of maintenance. E. H. Sears requested that the factory send new sickles because the ones they had received broke when sharpened. Sears requested well-hardened sickles that could both do the work and

⁴²⁷ N. A. Brudden to Cyrus Hall McCormick, April 29, 1854, McCormick Mss 2X, Micro 2021, Reel 5, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society; Robert Young to Cyrus Hall McCormick, June 2, 1855, McCormick Mss 1A, Box 7, C.H.M. Correspondence; William B. Silver to Cyrus Hall McCormick, June 12, 1855, McCormick Mss 1A, Box 7, C.H.M. Correspondence; A. B. Metcalf to Cyrus Hall McCormick, February 6, 1854, McCormick Mss 2X, Micro 2021, Reel 5, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society.

⁴²⁸ George L. Young to Cyrus Hall McCormick, July 12, 1858, McCormick Mss 1A, Box 15, C.H.M. Correspondence; John R. Shaffer to Cyrus Hall McCormick, September 17, 1867, McCormick Mss 1A, Box 25, C.H.M. Correspondence.

live up to farmers' expectations of maintainability.⁴²⁹ When manufacturers like McCormick made sections difficult to get or expensive, farmers threatened to take their business elsewhere.⁴³⁰ Farming people had some expectations that manufacturers would take a certain amount of responsibility for the maintenance and maintainability of their machines and asserted this claim when able. Yet most of the labor of the care of machine knives remained their own responsibility as manufacturers remained more interested in sales than maintenance. As such, the maintenance of knives remained largely under the control of farming people.

Sewing machine needles were a parallel to the sickles of reaping and mowing machines. Sewing machine companies and women who wrote testimonials for sewing machine companies often claimed their needles could last more than a decade—longer than was typical for field machine knives.⁴³¹ Yet many women purchased replacement needles. Sewing machine trade literature often included prices and instructions for ordering different types of sewing machine needles. A price catalog for the Singer Sewing Machine Company showed a range between 75 cents and \$1.50 for different types of needles.⁴³² Farmers also recorded purchasing these needles in their diaries,

⁴²⁹ E. H. Sears to Cyrus Hall McCormick, August 24, 1867, McCormick Mss 1A, Box 25, C.H.M. Correspondence.

⁴³⁰ George Walker to Cyrus Hall McCormick, December 6, 1859, McCormick Mss 1A, Box 15, C.H.M. Correspondence.

⁴³¹ "Facts for the Ladies." *Godey's Lady's Book*, June 1870, vol. 80, 579; "Our Arm Chair-Facts for the Ladies." *Peterson's*, June 1870, 474; Editor's Table. "Mrs. T. Edmondson." *Peterson's*, November 1869, 392.

⁴³² "Trade Price List of Standard Singer Sewing Machines" (Chicago, n.d.), Box 18, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/2715/>.

sometimes for prices lower than these offered by the Singer company.⁴³³ The demand for these replacement needles was great enough that some companies were founded to manufacture sewing machine needles alone.⁴³⁴ *Godey's Lady's Book* also included advertisements and mentions of replacement needles.⁴³⁵

Farming people's regular machine maintenance practices allowed them to keep machines going and to avoid some of the risks of machine ownership and farming. Maintenance practices also brought industrial capitalism more thoroughly into farm life as farmers relied on this new form of maintenance labor and on some new manufactured products to ensure the functioning of machines components of technological systems. Maintenance was a point of contention between farmers and machine manufacturers, however, as farming people sought to maintain machines without relying entirely on manufacturers and their agents. Farming people built maintenance practices in conversation with manufacturers and their agents, but also out of their own machine knowledge and in the context of their daily lives. In doing so, they maintained some autonomy over the maintenance of their machines, and thus control over the technological systems of their farms.

⁴³³ Michie, "Self Doing Naught," August 12, 1869; Vawter, "Diary," March 10, 1866; Henry Hyman Straw, "Account Book" (1875-1877), P2769, Box 1, Henry Hyman Straw and Family papers, Minnesota Historical Society, p. 42, 58; John Campbell Bailey, "Diary" (1868), November 23, 1868, p. 40, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum.

⁴³⁴ "Jobbing Price List from C. M. Linington and Bro." (New York, 1874), Box 18, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/2689/>; "Sewing Machine Needles." *Grange Advance*, October 27, 1875, 8; William Clarke and Sons to Beeson and Lamb, September 27, 1884, L354, Box 5, Folder 11, Isaac W. Beeson Papers, Indiana State Library.

⁴³⁵ "Our Superior Needles." *Godey's Lady's Book*, December 1866, vol. 73, 562.

Farmer Repairs

Once breakages occurred, farmers could not resolve them by routine maintenance practices. Farming people instead addressed breakages through immediate repair and tinkering on the farm. Farming people themselves built machine knowledge and practices of machine repair that also allowed them to mitigate the risks of machine use and ownership. They handled many of these repairs the same way they handled much farm work: through their systems of labor organization that relied on family labor and help from hired hands and neighbors. Additionally, they could seek the help of local tradesmen like wagon makers and blacksmiths who had some experience and expertise related to repair. In relying on one another for the repair of broken machines, farming people encountered some conflicts within farming communities, but they also produced the technological systems of industrial agriculture through their social systems of labor organization as well as through their own growing aptitude with machines. Producing these systems through their own efforts of repair left farmers in control of those systems on the farm.

Sometimes machines did not work well immediately and broke repeatedly in the first harvest.⁴³⁶ Calvin Fletcher had this problem when he first purchased a reaper in

⁴³⁶ Rollins, "Diary," July 30, 1872, Reel 2.

1853. The company agent's involvement in setting the machine up did not prevent the machine from struggling through the first few days of use. Fletcher recorded:

Cut south of the Lane and it took sometime before could get machine right. The band slipt off the wheel but remedied it by putting a leather band round the wheel itself and then ran the band on that. By this arrangement we thus got it arranged (...).⁴³⁷

Even with this fix, the machine did not cut quite as much as Fletcher had expected and he may have had to tinker with it further over the course of the harvest. Farmers often needed a bit of time and effort to make their machines work in their fields. The combined result of this time and effort was not only a functioning machine, but a working knowledge of that machine on the part of the farmer—both of which were essential to the functioning of the overall system.

Repeated initial breakages could also happen with sewing machines. Minnesota farm woman Ann Brackett experienced this problem when she purchased a machine from a neighbor woman who seems to have been acting as a company agent. The machine did not work well initially, and Brackett had to have the neighbor over multiple times to attempt to repair the machine. Eventually, Brackett was furnished with a replacement machine, but she still found it necessary to bring the replacement machine to the neighbor's house only a few days later in order to get it fixed again.⁴³⁸ Over the next few

⁴³⁷ Fletcher, *Diary*, vol. 5, (1853-1856), June 25-28, 1853, 83-85.

⁴³⁸ Brackett, "Journals, Volume Three," June 9, 1871, p. 68; Brackett, "Journals, Volume Three," June 13, 1871, p. 69; Brackett, "Journals, Volume Three," June 21, 1871, p. 70.

months, Brackett recorded more instances of her neighbor fixing the machine.⁴³⁹ It could take some time for farm women to make machines work in their homes and communities.

In the case of field machines, repeat breakages could take time and effort away from the harvest itself at a critical time for grain farming. Trips to town for repair parts took farmers away from their fields during the harvest. Lorenzo Dow Brown traveled overnight to find “machine guards,” on July 25th, 1860 after his reaper’s second breakage, but the machine nonetheless continued to have problems a few days later.⁴⁴⁰ Multiple breakages in August 1869, following an initial breakage that, “stopped our work,” on the 2nd, caused John Cummins to report on August 15th that his family “would have finished the wheat but the knife broke.”⁴⁴¹ The next year Cummins also noted a breakage delay that prevented him from starting to reap until half the day had passed.⁴⁴² Farming people had to address these breakages and delays.

The mixed use of hand implements and machines together was a strategy to continue harvesting even after a breakage. Anson Buttles, for instance, continued harvesting by cradle several times after reapers broke in the 1860s.⁴⁴³ Yet cradling was slower work, and often the difference in time that a cradle and a functioning reaper could take was manifest in wasted crop as well. Nevertheless, when farmers could supplement

⁴³⁹ Brackett, “Journals, Volume Three,” September 12, 1871, p. 79; Brackett, “Journals, Volume Three,” September 14, 1871, p. 79.

⁴⁴⁰ Lorenzo Dow Brown, “Journal Transcriptions,” June 26, 1860, Box 1, Folder 2, pg. 10; Lorenzo Dow Brown, “Journal Transcriptions,” July 25-29, 1860, Box 1, Folder 2, pg. 19-21.

⁴⁴¹ Cummins, “Diary,” August 2-11, 1869, Reel 1, Frame 1160.

⁴⁴² Cummins, “Diary,” July 22, 1870, Reel 1, Frame 1222. For breakages causing delays, see also, Woodbury, Woodbury, and Woodbury, “Diary,” 176; Bailey, “Diary” (1869), August 2, 1869, p. 35.

⁴⁴³ Buttles, September 20, 1867, Reel 2; Buttles, September 26, 1867, Reel 2; Buttles, August 18, 1868, Reel 2.

the missing work of a broken machine with hand tools, they were able to sustain the harvest process without being entirely dependent on manufacturers and their agents for repairs.

Threshing machine breakages could also bring labor processes to a standstill and put the products and profits of the harvest at risk.⁴⁴⁴ Even if breakages did not completely stop operations, they could seriously slow them down. Diaries noted time lost to breakage and repair. Harman Cotterman noted that “we do not get much work done” on a day the machine was broken.⁴⁴⁵ John Cummins experienced a similar situations in 1860. He noted that they “would have threshed more but lost time from the bolt plug.”⁴⁴⁶ Farmers who owned threshers had more to lose than just time when breakages happened. Calvin Fletcher noted in his diary after a threshing breakage that “this bad luck is common with threshing.” Time, wheat, and money could be lost to these machine breakages.⁴⁴⁷

Traveling threshermen spent much time repairing breakages.⁴⁴⁸ Their tinkering might have looked something like Hamlin Garland’s description in *Boy Life on the Prairie*: “David and William and Len returned to the machine to put everything in order, to sew the belts, or take a bent tooth out of the ‘concave.’”⁴⁴⁹ Such activities fast became a common feature of rural life.

⁴⁴⁴ Ferguson, “Diary, October 15, 1869.

⁴⁴⁵ Cotterman, “Diary” September 1, 1875, Box 1, Folder 1.

⁴⁴⁶ Cummins, “Diary,” August 31, 1860, Reel 1, Frame 535.

⁴⁴⁷ Fletcher, *Diary*, vol. 8, (1863-1864), August 3, 1863, 190.

⁴⁴⁸ John Walter Bassett, “Diaries” (1864-1939), July 28, 1875, RG3002.AM, John Walter Bassett collection, 1847-1939, Nebraska State Historical Society; Bailey, “Diary” (1867), October 18, 1867, p. 31.

⁴⁴⁹ Hamlin Garland, *Boy Life on the Prairie* (New-York: Harper and Brothers, 1899), 176; See also, Buttles, August 31, 1860, Reel 1; Buttles, September 18, 1860, Reel 1; Buttles, September 21, 1865, Reel 1; Buttles, September 23, 1865, Reel 1; Buttles, October 16, 1866, Reel 2.

The increased importance of machine work to the labor of the entire farming household demonstrates the industrialization of the farm as a whole. Threshing machine breakages not only delayed the threshing process, but also meant more labor for the farming women who cooked and cared for the threshers. If the machine broke and the threshing party had to remain another day, the party might still have to eat. Even if the party did not remain for the meal during the delay, the prepared meal could go bad and women would have to spend another day's difficult labor preparing another meal.⁴⁵⁰ Machine breakages were felt not only in the fields but also in the gendered labor of keeping a farming household.

Repairing machines to deal with breakages became a common feature of farm family labor. Men, and sometimes boys, most often did the repairing of field machines.⁴⁵¹ Elise Dubach Isely, on the other hand, remembered not being involved in that side of farm life and labor. She referred to what she thought was the clogging of a threshing machine as something that she and her sisters overheard while working but that "did not concern us."⁴⁵² Other women paid closer attention to what was going on in the fields with machines. Martha E. and Martha A. Woodbury both recorded where the men of their family were taking reapers, mowers, and threshers on given days, made note of multiple

⁴⁵⁰ A Dakota farm woman gave an illustrative account of how machine breakages could create a situation in which "the men must be laid off, the meat in the pantry spoil" in 1889, but her experience applies to the middle decades of the century as well, when the task of preparing meals for threshers as well as machine breakages were no less common than in the 1880s. See, *Dakota Farmer*, August 1889, p. 11, cited in Reynold M. Wik, *Steam Power on the American Farm* (Philadelphia: University of Pennsylvania Press, 1953), p. 234n93.

⁴⁵¹ Rollins, "Diary," July 27-28, 1877, Reel 3; William Henry Venable, *A Buckeye Boyhood, 1836-1920* (Cincinnati: Stewart and Kidd, 1911), 96.

⁴⁵² Isely, 190.

breakages, and described how the men of the family addressed those breakages.⁴⁵³

Machines, breakages, and repairs were clearly present in farm women's lives.

Women were more actively involved in the repair of their household machines, especially sewing machines. Men sometimes repaired sewing machines for their wives.⁴⁵⁴

Yet women were involved in the daily maintenance of sewing machines and repaired them as well. *Godey's Lady's Book* ran an article in 1871 which identified the breaking of thread as the most common hitch in the sewing process and claimed, "nearly all other little disarrangements that occur can usually be overcome by any person of ordinary ingenuity." The article went on to describe the common causes of the problem and also recommended that "simply smoothing the guide holes with a small round file" was enough to solve this problem.⁴⁵⁵ Sewing machine trade literature aimed at women contained information about how machines should function that would assist them in making repairs. That same literature was also aimed at the agents of sewing machine companies, however.⁴⁵⁶ One catalog bragged about how little repairs its machine would need, thus allowing that "agents be relieved of this labor."⁴⁵⁷ These sewing machine

⁴⁵³ Woodbury, Woodbury, and Woodbury, "Diary," passim, 176, 192, 194, 253, 176-177, 239, 249, 253, 308-309.

⁴⁵⁴ Michie, "Self Doing Naught," April 29, 1871.

⁴⁵⁵ "Hints to Persons Using Sewing Machines." *Godey's Lady's Book*, February 1871, vol. 82, 197.

⁴⁵⁶ "The Ne Plus Ultra Prices of Sewing Machines" (Chicago, n.d.), Box 18, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/2697/>; "The New Domestic Family and Manufacturing Sewing Machines" (New York, n.d.), Box 1, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/2697/>.

⁴⁵⁷ "Geist Manufacturing Company, Manufacturers of Improved Singer Sewing Machines" (Chicago, 1879), Box 18, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/2710/>.

agents who might handle repairs were not necessarily always men. Machine companies sometimes explicitly advertised for “male or female” agents.⁴⁵⁸

Farm women also actively repaired their sewing machines, for themselves and for one another. In 1874, Julia Hand received a visit from her friend in which her friend attempted to set Hand’s sewing machine right. Her friend’s efforts brought mixed results as she did “the machine some good but it does not work yet.” Three days later, Hand managed to solve the problem herself when she “got down to the machine and got it sewing at last.”⁴⁵⁹ Even when farm women went to those from whom they purchased machines for help, they might still be dealing with other women involved in machine maintenance. Ann Brackett, for instance, tended to seek out the neighbor woman from whom she ordered her sewing machine—and who may have been acting as a company agent—for help with repairs and adjustments.⁴⁶⁰ Farm women thus participated in mechanical labor and maintenance.

Farming families as a whole repaired machines and reasserted control of their technological systems after a breakage. In doing so, farming people made use of some of the same knowledge and skills that they developed through types of repairs around the farm. William Henry Venable wrote of his boyhood in antebellum Ohio that “in those

⁴⁵⁸ “The Ten Dollar Novelty Sewing and Embroidering Machine” (Boston, n.d.), Box 2, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/4973/>; “Wanted-Agents.” *Godey’s Lady’s Book*, July 1867, vol. 75, pg. 1.

⁴⁵⁹ Hand, “Diary,” January 5, 1874); Hand, “Diary,” January 8, 1874.

⁴⁶⁰ Brackett, “Journals, Volume Three,” June 3, 1871, p. 67; Brackett, “Journals, Volume Three,” June 9, 1871, p. 68; Brackett, “Journals, Volume Three,” June 13, 1871, p. 69; Brackett, “Journals, Volume Three,” June 21, 1871, p. 70; Brackett, “Journals, Volume Three,” September 12, 1871, p. 79; Brackett, “Journals, Volume Three,” September 14, 1871, p. 79.

comparatively primitive days one man learned to do several kinds of technical work. Almost of necessity the average farmer strove to become, if not a master-mechanic, at least a jack-of-all-trades.”⁴⁶¹ Among those kinds of technical work that would have helped in the repair of farm machines were carpentry and blacksmithing. These skills were useful for repairing the implements that preceded machines as well. Andrew Peterson, for instance, developed an aptitude for carpentry that he used to repair the wooded pieces of implements such as the handles for hoes and scythes.⁴⁶² Farmers with metallurgical knowledge or blacksmithing skills could adjust the metal parts of machines as they had the metal parts of implements like plows. In addition to these knowledges, farming people also required the space and tools for blacksmithing and carpentry work. While not every farm would have had all of these materials, Venable remembered his father’s farm as outfitted with a forge, turning-lathe, carpenter’s bench, and other associated tools.⁴⁶³ Farm families thus cultivated the knowledge and practices necessary to address machine problems when they arose.

Farm families could not take care of all repair jobs. The need for parts, materials, or extra machine knowledge sent farming families looking for help to handle their repairs. While the growth of company agency structures and small machine factories offered sources of repair help that connected farmers to wider markets, farming people

⁴⁶¹ Venable, 96.

⁴⁶² Peterson, “Diary,” February 22, 1855, Reel 2, pg. 3; Peterson, “Diary,” June 1, 1858, Reel 2, pg. 35; Peterson, “Diary, August 13, 1858, Reel 2, pg. 37; See also, Buttles, August 5, 1862; Buttles, August 17, 1868, Reel 2.

⁴⁶³ Venable, 97.

also sought help from their machine-minded neighbors and from rural mechanics and blacksmiths in ways that fit with their local systems of organizing farm life. They built practices of machine maintenance within their own communities that allowed them to produce and maintain systems of mechanized grain farming.

Farming people got help from neighbors when a machine broke. The Woodbury farming family, for instance, received help when reaper breakages delayed their harvest. First, their neighbor helped them to fix their machine, and then, upon another breakage shortly thereafter, another neighbor let them borrow his machine to finish the harvest.⁴⁶⁴ In some cases, neighbors helped one another in turn with repairs.⁴⁶⁵ Certain individuals became adept repairers and did this work more often for neighbors, sometimes for cash payment and sometimes for other forms of repayment.⁴⁶⁶ Some of these were men like Hade Wells who adopted machine-oriented roles in harvest labor systems. Wells not only conducted much of the reaping and mowing done by machine on Calvin Fletcher's farm in the mid-1860s, but also conducted most of the necessary repairs for those machines. Further, when the job required a trip into town for parts, or the help of a company agent, Wells traveled with the machine while others remained behind to continue the work with handheld implements.⁴⁶⁷ Wells was also involved in the repair of those handheld implements. In fact, Wells not only repaired implements but built an entire harrow from

⁴⁶⁴ Woodbury, Woodbury, and Woodbury, "Diary," 176, 177.

⁴⁶⁵ Bailey, "Diary" (1875), July 29-30, 1875, p.33; John Campbell Bailey, "Diary" (1876), July 24, 1876, p. 33, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum.

⁴⁶⁶ Witham, 1.

⁴⁶⁷ Fletcher, *Diary*, vol. 8, (1863-1864), June 30, 1863, 153; Fletcher, *Diary*, vol. 8, 1863-1864, July 13, 1863, 177.

scratch in 1865.⁴⁶⁸ Farmers and farm workers who acquired an aptitude for machine work made repair one of their chief responsibilities in systems of labor organization on the farm

Rural blacksmiths, wagon-makers, and mechanics also helped with repairs. These men could often be farmers themselves. They operated shops, often on farms of their own, out of which they would repair various agricultural implements.⁴⁶⁹ William Henry Venable described the shop and activities of a mid-century wagon-maker who “actually made wagons, not by machinery but by hand, with such simple tools as are usually contained in a carpenter’s chest.”⁴⁷⁰ Blacksmiths in particular took up the task of outfitting the animal components of farmers’ technological systems by shoeing horses.⁴⁷¹ They also brought things like plows or sleighs with large iron parts to blacksmiths.⁴⁷² Blacksmiths also repaired sickle and cradle knives.⁴⁷³ Farmers sought out rural blacksmiths for repairs to farm machines, as well.⁴⁷⁴

⁴⁶⁸ Fletcher, *Diary*, vol. 9, (1865-1866), March 20, 1865, 36.

⁴⁶⁹ Aldren A. Watson, *The Village Blacksmith* (New York: Crowell Company, 1968), 59-64, 81-91; Jeanette Lasansky, *To Draw, Upset, and Weld: The Work of the Pennsylvania Rural Blacksmith, 1742-1935* (Lewisburg, PA: Union County Historical Society, Oral Traditions Project, 1980).

⁴⁷⁰ Venable, 96.

⁴⁷¹ Fletcher, *Diary*, vol. 8, (1863-1864), June 11, 1864, 413; William Beattie, “Diary Transcription” (1866-1867), May 23, 1866, William Beattie Diary Collection, Wellington County Museum and Archives, Accessed online via Rural Diary Archive; Beattie, “Diary,” June 18, 1866; Beattie, “Diary,” February 13, 1867; Ferguson, “Diary,” January 17, 1870.

⁴⁷² James R. Stewart, “The Diary of James R. Stewart: Pioneer of Osage County,” ed. Lynn H. Nelson, *Kansas Historical Quarterly* 17, no. 1 (February 1949), 10; Robert Russell, “Memorandum and Diary for the Years 1876-1900 of Robert Russell Proton Township, Grey Co., Ontario” (1876-1900), transcribed and edited by Delbert Russell, April 8, 1876, p. 12, Robert Russell Diary Collection, Archival and Special Collections, University of Guelph, Accessed online via Rural Diary Archive.

⁴⁷³ Woodbury, Woodbury, and Woodbury, “Diary,” p. 239.

⁴⁷⁴ “Taplin’s Horse Power.” *Prairie Farmer*, August 1845, 204; Buttles, September 18, 1860, Reel 1; Robert Russell, “Diary,” September 27, 1877, p. 48.

The necessity of machine repairs also created the space for the increased mechanical work of farmer-mechanics. Elise Dubach Isely remembered her father building up his farm workshop in the 1850s and 1860s. He did repairs and also made implements for farmers in his area.⁴⁷⁵ He had aquired some of this knowledge from his previous work in a foundry. While Isely did not mention what the foundry that her father worked in manufactured, most farm machine factories grew out of foundry operations.⁴⁷⁶ Farmers with foundry experience could contribute to the repair of machine parts made in foundries. But not all farmer-mechanics came to their knowledge through foundry work. Many individual farmers who cultivated the necessary knowledge and skill became farmer-mechanics.

Lorenzo Dow Brown: Farmer-Mechanic

Lorenzo Dow Brown of Indiana was one such farmer-mechanic whose work with machines extended out of general farm repair work. His farm machine repair work demonstrates how such work was fit into patterns of rural life and labor, as well as how some farmer-mechanics created new social roles for themselves through machine maintenance. Farmer-mechanics allowed farming people in general to seek one another for help and to not depend solely on manufacturers and their agents for machine repair.

⁴⁷⁵ Isely, 136-137.

⁴⁷⁶ Isely, 16; Winder, 38; Hounshell, 153-188.

Brown was a farmer and wagon-maker who thoroughly involved himself in machine repairs. Brown's repair experience carried over from activities he did with implements.⁴⁷⁷ Sometimes his neighbors paid him back for his repair work simply by letting him use the implements he repaired for them. In 1871, for instance, he fixed an old scythe owned by a neighbor named Wesley and Brown used that scythe to clear some weeds.⁴⁷⁸ By the mid-1870s, Brown charged other farmers for repairing their harrows and other implements.⁴⁷⁹ Brown specialized in wagon-making. He invented his own buggy and got a patent for its design as well as for some supplemental features.⁴⁸⁰ He also repaired pieces of buggies for neighbors beginning in the mid-1860s and continued to do so for decades after.⁴⁸¹ His interests and aptitudes did not stop with buggies and wagons, however. In fact he had an interest in clocks as well and often tinkered with and oiled clocks for his neighbors.⁴⁸² These mechanical interests channeled Brown's activities

⁴⁷⁷ Lorenzo Dow Brown, "Journal Transcriptions," April 21, 1859, Box 1, Folder 1, p. 12; Lorenzo Dow Brown, "Journal Transcriptions," May 31, 1865, Box 3, Folder 5, p. 15; Lorenzo Dow Brown, "Journal Transcriptions," June 5, 1865, Box 3, Folder 5, p. 19; Lorenzo Dow Brown, "Journal Transcriptions," January 18, 1866, Box 3, Folder 6, p. 3; Lorenzo Dow Brown, "Journal Transcriptions," July 7, 1873, Box 3, Folder 12, p. 42.

⁴⁷⁸ Lorenzo Dow Brown, "Journal Transcriptions," August 12, 1871, Box 3, Folder 10, p. 49.

⁴⁷⁹ Lorenzo Dow Brown, "Journal Transcriptions," May 4, 1877, Box 4, Folder 3, p. 41.

⁴⁸⁰ For information relevant to Brown's various inventions, especially his patent buggy, see Box 6, Folder 12 of Dow Brown Journals and Transcriptions, 1859-2001. M 0789. Indiana Historical Society.

⁴⁸¹ Lorenzo Dow Brown, "Journal Transcriptions," May 13, 1864, Box 3, Folder 4, p. 16; Lorenzo Dow Brown, "Journal Transcriptions," May 31, 1864, Box 3, Folder 4, p. 17; Lorenzo Dow Brown, "Journal Transcriptions," August 30, 1866, Box 3, Folder 6, p. 30; Lorenzo Dow Brown, "Journal Transcriptions," March 27-30, 1872, Box 3, Folder 11, p. 24.

⁴⁸² Lorenzo Dow Brown, "Journal Transcriptions," January 27, 1863, Box 3, Folder 3, p. 3; Lorenzo Dow Brown, "Journal Transcriptions," January 20, 1864, Box 3, Folder 4, p. 4; Lorenzo Dow Brown, "Journal Transcriptions," January 20, 1864, Box 3, Folder 4, p. 4-5; Lorenzo Dow Brown, "Journal Transcriptions," February 4, 1864, Box 3, Folder 4, p. 5; Lorenzo Dow Brown, "Journal Transcriptions," December 9, 1865, Box 3, Folder 5, p. 39; Lorenzo Dow Brown, "Journal Transcriptions," January 16, 1871, Box 3, Folder 10, p. 6.

towards machine repair and maintenance. His repair work with farm implements fit in to a number of methods of local labor exchange among farming people.

Brown's machine repair work fit into labor organizing systems of both exchanging work for work as well as for cash and the use of machinery. In fact, sometimes Brown only had to repair machines because he was using them, such as when a neighbor's reaper broke on his field in 1859. He had to fix it in the field in order to get on with the harvest.⁴⁸³ In 1863, Brown was able to secure the use of another farmer's reaper on his own wheat, but first he both drove the machine on that farmer's field and then did a little repair work on the machine. He performed the general maintenance task of sharpening the sickle and also performed a necessary repair on the "little wheel."⁴⁸⁴ In other instances, Brown was paid for his repair work.⁴⁸⁵ The practice of reciprocal machine sharing and paid work could overlap, however. Brown was paid \$2.75 by Father Robinson for the repair of a reaper platform in June 1864. In addition to the money, he also used Father Robinson's machine to harvest his own wheat.⁴⁸⁶ Brown was also involved in the use of Robinson's machine on other farms and helped to set up the machine for work.⁴⁸⁷ Other farmers helped Brown in exchange for the use of his expertise and his shop for maintenance, as when one farmer, "helped me grind both machine

⁴⁸³ Lorenzo Dow Brown, "Journal Transcriptions," July 7, 1859, Box 1, Folder 1, p. 23.

⁴⁸⁴ Lorenzo Dow Brown, "Journal Transcriptions," July 7-9, 1863, Box 3, Folder 3, p. 20.

⁴⁸⁵ Lorenzo Dow Brown, "Journal Transcriptions," May 31, 1864, Box 3, Folder 4, p. 17; Lorenzo Dow Brown, "Journal Transcriptions," June 18, 1864, Box 3, Folder 4, p. 19.

⁴⁸⁶ Lorenzo Dow Brown, "Journal Transcriptions," June 23-24, 1864, Box 3, Folder 4, p. 20; Lorenzo Dow Brown, "Journal Transcriptions," June 30-July 1, 1864, Box 3, Folder 4, p. 20.

⁴⁸⁷ Lorenzo Dow Brown, "Journal Transcriptions," July 19, 1865, Box 3, Folder 5, p. 23.

sickles and I ground his drawer knife and mine.”⁴⁸⁸ Brown also did repairs on other farm machines used in grain farming like drills and threshers. In 1866, he put on a new frame to the screen of a neighbor’s thresher. He was paid \$1 for this service, but also made use of that threshing machine.⁴⁸⁹ He repaired a wheat drill for Father Robinson and then borrowed Robinson’s mowing machine to cut his own grass later that day.⁴⁹⁰ Delving into machine repair was thus a good way for a farmer and mechanic like Brown to secure machines for his own use as well as to earn extra cash income. As industrial capitalism emerged on the farm in the context of mechanization, some individuals found new economic niches.

Brown’s forays into sewing machine repair, however, took him out of the fields and into conflicts about payment for his repair work that were complicated by gender. After Brown purchased a sewing machine for his own family, he began to devote portions of his time to this mechanized task and even inserted himself into the reciprocal exchange of what was more often women’s labor.⁴⁹¹ Brown became such an avid seamster that he applied his mechanical talents to the creation of a mechanism to allow him to sew at night: “I completed the arrangement of our coal oil lamp with reflector to give light for sewing on Machine after night.”⁴⁹² He also began to apply his repair skills to these machines directly, beginning when a neighbor’s wife “got me to fix her sewing

⁴⁸⁸ Lorenzo Dow Brown, “Journal Transcriptions,” August 12, 1875, Box 4, Folder 1, p. 67.

⁴⁸⁹ Lorenzo Dow Brown, “Journal Transcriptions,” August 30, 1866, Box 3, Folder 6, p. 30.

⁴⁹⁰ Lorenzo Dow Brown, “Journal Transcriptions,” September 6-7, 1871, Box 3, Folder 10, p. 54.

⁴⁹¹ See chapter 1 of this dissertation.

⁴⁹² Lorenzo Dow Brown, “Journal Transcriptions,” December 1873, Box 3, Folder 11, p. 83.

machine for her.”⁴⁹³ This kind of work brought him into relation with the women of other farm families, whereas he would have likely worked with men when repairing machines.

Brown encountered multiple conflicts with other farming families about payment for this type of repair work. He recorded his disappointment on a few occasions in which a neighbor did not pay him for his repair work on a sewing machines, although he did, in later months, get some money.⁴⁹⁴ Brown may have had to try harder to get compensation out of his neighbors for sewing repair work because it did not fit as directly into their systems for exchanging harvest work and the use of harvest machines. He may also have had some difficulty in getting paid because the men of other families controlled the cash while women controlled the sewing machines. Stepping into a space of gendered women’s work like sewing, even if it was only to perform the perfectly masculine task of machine repair, made it more difficult for Brown to communicate the importance of his repair work to neighbors.

Brown’s growing aptitude with machines over time demonstrates the development of machine knowledge on the part of farmers over these decades. He began in the early 1860s repairing pieces of farm machines that most resembled the wagons and buggies he worked on most frequently. These were often wheels, like the “little wheel” repaired in July, 1863 and the wheel of a Buckeye reaper that he was to “file off” in

⁴⁹³ Lorenzo Dow Brown, “Journal Transcriptions,” August 8, 1872, Box 3, Folder 11, p. 55.

⁴⁹⁴ Lorenzo Dow Brown, “Journal Transcriptions,” October 22, 1877, Box 4, Folder 3, p. 88; Lorenzo Dow Brown, “Journal Transcriptions,” April 12-13, 1878, Box 4, Folder 4, pg. 35; Lorenzo Dow Brown, “Journal Transcriptions,” November 3, 1878, Box 4, Folder 4, p. 92.

1866.⁴⁹⁵ In the second half of the 1860s, he began to identify, repair, and even construct whole complex parts like the “pitman” of a mower and the chain to the sickle bar.⁴⁹⁶ He was able to do so in part by expanding beyond carpentry and simple mechanics into blacksmithing and metallurgy, which he continued more seriously in the 1870s.⁴⁹⁷ By the early 1880s, he recorded the process of blacksmithing machine teeth: “I hardened 6 long ones by heating them to a welding heat and then rubbed them with red hot cast iron that coated them then I plunged them in cold water which makes them hard as flint.”⁴⁹⁸ It was also in the 1870s and 1880s that Brown began to get more involved in sewing and sewing machine repair as he turned his attention to metal as much as wood. Brown’s development as a mechanic shows the way in which some rural people cultivated machine knowledge over the course of these decades and made a space for themselves in rural communities based on that knowledge.

Farming people had to address machine breakages in order to keep their machines going and prevent losses. They turned to their families, neighbors, local tradesmen, and farmer-mechanics like Brown to do so. As they developed practices of machine maintenance, farming people continued to produce the technological systems of mechanized farming out of their social systems of labor organization. They made

⁴⁹⁵ Lorenzo Dow Brown, “Journal Transcriptions,” July 8, 1863, Box 3, Folder 3, p. 20. Lorenzo Dow Brown, “Journal Transcriptions,” July 17, 1866, Box 3, Folder 6, p. 25.

⁴⁹⁶ Lorenzo Dow Brown, “Journal Transcriptions,” June 30, 1864, Box 3, Folder 4, p. 20; Lorenzo Dow Brown, “Journal Transcriptions,” July 21, 1868, Box 3, Folder 8, p. 20; Lorenzo Dow Brown, “Journal Transcriptions,” July 22, 1868, Box 3, Folder 8, p. 49.

⁴⁹⁷ Lorenzo Dow Brown, “Journal Transcriptions,” January 13, 1875, Box 4, Folder 1, p. 3; Lorenzo Dow Brown, “Journal Transcriptions,” January 3, 1877, Box 4, Folder 3, p. 2.

⁴⁹⁸ Lorenzo Dow Brown, “Journal Transcriptions,” July 6, 1881, Box 4, Folder 7, p. 87.

neighbors and kin into components of these systems alongside machines. In doing so, they contributed to the development of industrial capitalism on the farm. Yet the agents of more powerful industrial capitalists, as well as the agents of financial capitalism, approached the issue of repair with other goals.

Agent Repairs

Sometimes farming people had to turn to machine company agents for assistance in repairs. Company agents were invested in the repair and maintenance of machines as they needed farmers to make payments as well as to purchase replacement parts. In this assistance, however, there was conflict about the credit for, and authority over, the work of maintaining and producing the technological systems of mechanized agriculture as farmers and agents asserted the importance of their own repair efforts. Manufacturers and their agents were also often interested in repair from the perspective of company sales. Farmers, on the other hand, practiced maintenance and repair in an effort to avoid any further losses that often included doing so outside the purview of manufacturers and their agents.

Machine companies began to build internal systems for repair services in the middle decades of the century as a part of their sales strategies. Sewing machine companies often sought to recruit agents with mechanical skill in order to handle repairs, but it was common for machines to be shipped back to either the factory it was made

in.⁴⁹⁹ Field machine companies, who could not ship reapers and threshers back to the factory so easily, relied far more on agents for repairs. The McCormick company established the task of handling repairs as the responsibility of its agents from its earliest operations and early McCormick agent contracts listed it as one of agents' responsibilities.⁵⁰⁰ The McCormick company noted the increasing responsibilities of its agents to do repairs in the 1850s. A circular noted that "the subject of 'repairs,' also, is now assuming a degree of importance not heretofore felt," and further mandated that agents must "sell repairs, as well as reapers and mowers." This included the responsibility of selling the extra sickle blades, but also a number of other repair parts for each machine.⁵⁰¹ McCormick thus was compelled to pursue repair as a necessity of making sales, rather than as a necessity of preserving machines as farmers were.

Companies promised agents would be available for repairs in their advertising. One mower advertisement read, "give notice to the agent and allow him time to send a person to put it in good order."⁵⁰² Nevertheless, those duties were limited in comparison to all of the repair work that machines would need. The McCormick company was

⁴⁹⁹ Brandon, 131-135; Hounshell, 91-92; Andrew B. Jack, "The Channels of Distribution for an Innovation: The Sewing-Machine Industry in America, 1860-1865," *Explorations in Entrepreneurial History* 9 (1957), 131.

⁵⁰⁰ "McCormick Contracts: R Emerson Junior's Exhibit D to Campbell's Deposition as Part of "MG 5539 In The Patent Office of the United States In the Matter of the Application of Cyrus H. McCormick for the Extension of His Patent for an Improvement in Reaping Machines, Dated January 31, 1845," 1856, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

⁵⁰¹ William S. McCormick, "Circular," 1858, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

⁵⁰² "McCormick's Two-Wheeled Mower (Order Form)," 1866, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

insistent that agents cajole farmers into getting repairs done early because it would be difficult to get parts and service in the busy harvest season.⁵⁰³ Hutchinson reported that McCormick would send a mechanic out from the Chicago factory to assist an agent who was incapable of handling their repair work, either due to their own inability or to the volume of demand. These mechanics, however, seemed only to have been available in the winter and not in the busiest months of the summer. They were thus tasked with putting the machines in order for the next season rather than dealing with complications as they arose during the harvest.⁵⁰⁴

Companies also sent out specific communications to agents with instructions about how to handle repairs on certain parts that were sold. One such part was the castor wheel on McCormick reapers and mowers. In 1860, the company drafted a form letter to respond to the “frequent inquiries as to *how* such and such parts are to be placed, or in what way used.” The placement of a castor wheel was giving many farmers problems. The company responded to these inquiries with a statement for farmers or agents who encountered the problem. First, the letter identified two possible causes. One was the over-tightness of a particular bolt, but another had to do with the compatibility of machines with different environments they might be operated within, as “owing to the condition of the ground, the wheel may have an outward tendency.” The circulars gave

⁵⁰³ William S. McCormick, “Circular,” 1858, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

⁵⁰⁴ Hutchinson, *Cyrus Hall McCormick: Seed-Time, 1809-1856*, 308.

agents information about how to do the repairs with the replacement parts they sold.⁵⁰⁵

The McCormick home office took an active interest in repair as a part of sales rather than as a part of the maintenance of mechanized agriculture year after year.

Farming people were most likely to involve agents and manufacturers in repairs when they needed new parts.⁵⁰⁶ McCormick agents, for their part, fielded increasing requests for repairs in the late 1850s and 1860s.⁵⁰⁷ In the 1860s, those requests sometimes included numbers that corresponded to company repair parts catalogs that agents might have familiarized themselves with, but others simply offered descriptions of the parts that were needed.⁵⁰⁸ Agents wrote in asking for more of these parts catalogs as well as “printed matter by experts” for their sub-agents.⁵⁰⁹ Some farmers requested copies of those parts catalogs for themselves in an effort to learn more about their machines and to

⁵⁰⁵ Cyrus Hall McCormick to John Morgan, “McCormick’s Reaping and Mowing Machines,” June 1860, McCormick Mss 5X, Box 1, Folder 16, McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society.

⁵⁰⁶ Brown and Jackson, *Minnesota Farmers Diaries*, 194-197; Bailey, “Diary” (1867), July 17, 1867, p. 21; Bailey, “Diary” (1868), July 1, 1868, p. 23; Bailey, “Diary” (1869), July 21, 1869, p. 34; Bailey, “Diary” (1871), July 5, 1871, p. 34; Bailey, “Diary” (1875), August 3, 1875, p. 33; Howell, “Diary,” (1868-1869), July 22, 1868; Lorenzo Dow Brown, “Journal Transcriptions,” June 26, 1860, Box 3, Folder 2, p. 19.

⁵⁰⁷ Comestock Gilkerson to Cyrus Hall McCormick, September 20, 1861, McCormick Mss 2X, Micro 2021, Reel 60, Frame 493, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society.

⁵⁰⁸ C. F. Blackstone to Cyrus Hall McCormick, August 1, 1867, McCormick Mss 2X, Micro 2021, Reel 60, Frame 12, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society; G. W. Russell to Cyrus Hall McCormick, August 5, 1867, M 231, Microfilm Reel 60, Frame 98, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society; George H. Morey to Cyrus Hall McCormick, n.d., McCormick Mss 2X, Micro 2021, Reel 60, Frame 471, McCormick Harvesting Machine Company Incoming Correspondence and Reports, 1849-1902. Wisconsin Historical Society. For a repair parts catalog issued to company agents, see, *Price List Catalog for C. H. and L. J. McCormick Repair Parts: Reapers, Mowers, and Advances, 1854-1875* (Chicago: Bryant, Walker and Co., n.d.). McCormick Mss 5X, Box 6, Folder 1. McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society.

⁵⁰⁹ G. W. Russell to Cyrus Hall McCormick, April 8, 1867, McCormick Mss 1A, Box 25, C.H.M. Correspondence.

develop their maintenance practices.⁵¹⁰ Farming people thus cultivated their own maintenance practices and machine knowledge even when dealing with company agents who were most interested in selling replacement parts.

Agents for threshing machine companies were also responsible for supplying replacement parts, and threshermen sought out the agents or machine shops of companies for repairs and replacements.⁵¹¹ Calvin Fletcher had to send for a wheel replacement for his threshing machine from the factory.⁵¹² Farmers could also identify the parts for threshing machines from trade literature and advertising. An advertisement for Wheeler's threshing machine contained a list of repair parts as well as contact information for requesting them.⁵¹³ For different types of machines, agents and manufacturers were the keepers and distributors of new replacement parts.

Even when agents and manufacturers supplied farmers with replacement parts, farmers still had to fit those parts into the machine. Even parts from the same year's manufacture of machine were not interchangeable. David Hounshell found no evidence that McCormick adopted a set of uniform gauges for the iron parts of machines until 1880. While agents may have been able to help to some extent, the responsibility for fitting any wrought or cast iron parts to the machine fell to rural people themselves,

⁵¹⁰ George Mouser to Cyrus Hall McCormick, July 23, 1867, McCormick Mss 1A, Box 25, C.H.M. Correspondence.

⁵¹¹ Buttles, September 5, 1873, Reel 2.

⁵¹² Fletcher, *Diary*, vol. 4, (1848-1852), April 19, 1852, 415.

⁵¹³ "Wheeler's Horse Power and Combined Thresher and Winnowing." *Ohio Cultivator*, April 1, 1854, 104-105.

which is why blacksmithing was such an important part of repair processes.⁵¹⁴ While company agents might also assist the farmer in putting the replacement parts into their machines, some farmers, like Irvin W. Rollins, could handle the application of these parts to their machines themselves.⁵¹⁵ Threshermen also installed replacement parts that they purchased themselves.⁵¹⁶ Sewing machine repair parts likewise had to be “fit in” to their machines. The Singer Sewing Machine Company, for instance, did not make interchangeable parts until the early 1880s. Sewing company agents often had to file down repair parts to fit into broken machines.⁵¹⁷

Farming people also developed alternative methods of securing replacement parts for their machines that allowed them to save money and avoid interacting with manufacturing companies, agents, and dealers. Farmers salvaged replacement parts from other machines and used them in their own. This was another practice they carried forward from their practices of maintaining old implements. Indiana farmer, Robert Taylor, for instance, recorded that he went to multiple neighbor’s home in search of “an old fragment of a cradle to mend ours with.”⁵¹⁸ John Campbell Bailey similarly retrieved

⁵¹⁴ Hounshell, 159; Gordon Winder argues that mass production came to the reaper industry earlier than Hounshell identifies, but does not dispute Hounshell’s claim that McCormick parts could not be called interchangeable until the 1880s; Cyrus Hall McCormick Jr., in *Century of the Reaper*, pg. 42, on the other hand, defends his father’s early factory and repair system, writing that they displayed, “an acute understanding of the interchangeability of parts, which is popularly supposed to have originated among the makers of automobiles.”

⁵¹⁵ Rollins, “Diary,” July 29, 1872, cash accounts, July, Reel 2.

⁵¹⁶ Buttles, September 27, 1866, Reel 2.

⁵¹⁷ Hounshell, 91-92.

⁵¹⁸ Robert Taylor, “Diary” (1863-1864), June 29, 1863, SC 2459, Robert Taylor Diary. Indiana Historical Society.

a part from a neighbor with which to mend his reaper in 1867.⁵¹⁹ Farmers could also take parts out of old machines that were scrapped. Lorenzo Dow Brown scrapped a mower in 1873 when he “took old Kirby Machine all apart and sold 536 lbs. and 97 lbs. other castings and 633 lbs.”⁵²⁰ He took the parts to town on a buggy to sell. He still had some parts of this machine around in 1875, however, as he “traded small cast wrench of Kirby machine to Vick for an old ax.”⁵²¹ These sorts of parts may have found their way into other farm machines, but they might also have been melted down or used for other purposes. This practice of salvaging new parts from old machines would increase over time as the Midwest and Ontario become more thoroughly populated by machines in the decades after 1875.

Some farmers even made new entire parts for their machines and thus cultivated independence in repair processes. They could do so more easily for hand implements than for machines. Farmers used their carpentry skills to craft wooden parts for machines and avoid purchasing replacement parts. Peterson himself “made a new tongue and evener for the reaper,” and other farmers likewise crafted replacement wooden parts throughout the middle decades of the century.⁵²² Lorenzo Dow Brown made a new tongue for a neighbor’s mowing machine in the course of his mechanic work as well. The process for doing so may have been similar to the process for making a tongue for a wagon, which he

⁵¹⁹ Bailey, “Diary” (1867-1869), July 27, 1867, p. 21.

⁵²⁰ Lorenzo Dow Brown, “Journal Transcriptions,” August 30, 1873, Box 3, Folder 12, p. 54.

⁵²¹ Lorenzo Dow Brown, “Journal Transcriptions,” November 26, 1875, Box 4, Folder 1, p. 99.

⁵²² Buttles, September 8, 1875, Reel 2; Peterson, “Diary,” August 4, 1875, 1873, Reel 2, p. 320

had experience with from his earlier work.⁵²³ By crafting entire replacement parts, farming people avoided purchasing replacements from manufacturers and their agents.

The differences between farmers' repair priorities and those of manufacturers and their agents caused conflict between the groups over that question. Agents sometimes blamed farmers for the necessity and severity of repairs and believed that farmers could care for their machines better with general maintenance. Some McCormick agents reported to the home office about the poor state of the machinery they had to try to get up running. They complained that farmers left machines outdoors, even in the winter, leaving agents with the responsibility of caring for the farmers' neglected machines.⁵²⁴ The farm press, on the other hand, sometimes blamed both farmers and agents for not maintaining machines properly. In an 1868 article titled, "Destruction of Farm Machinery," the *Prairie Farmer* lamented the "clusters of decaying machinery" seen on a railroad journey through the Western states. The *Prairie Farmer* blamed both agents and farmers for their neglect. Mowers, reapers, threshers, and various farm implements paid the price for the imprudence of company agents who left them poorly sheltered and "exposed to the elements." The article did not absolve individual farming families either and criticized them for improperly storing machines as well.⁵²⁵ Farmers and machine company agents contested over their res[ect]ive capabilities as machine maintainers.

⁵²³ Lorenzo Dow Brown, "Journal Transcriptions," August 12, 1871, Box 3, Folder 10, p. 49; Lorenzo Dow Brown, "Journal Transcriptions," July 5, 1864, Box 3, Folder 4, p. 21; See also, Henry A. Griswold, "Diary, January 1862-December 1871," September 7, 1866, p. 107.

⁵²⁴ Hutchinson, *Cyrus Hall McCormick: Seed-Time, 1809-1856*, 365.

⁵²⁵ "Destruction of Farm Machinery." *Prairie Farmer*, December 19, 1868, 193.

Farmers participated in machine repair and maintenance in different ways and with different goals than manufacturers and their agents did and set the stage for conflict over maintenance and repair. Manufacturers sought to sell machines and replacement parts. Farmers, on the other hand, sought to keep machines going with as little loss as possible. Their maintenance practices made the industrialization of grain agriculture possible and allowed them some autonomy in their use of machines.

Conclusion

Farming people responded to the precarity of nineteenth-century capitalism by building practices of machine maintenance that allowed them to weather the risks of financial capitalism. The care they took of their machines demonstrates one way that ordinary people adjusted to and survived financial capitalism as well as how, in doing so, they built the labor practices and material components of industrial capitalism in their own homes, fields, and communities. The changing structures of both the farm machine industry and of the machines themselves would affect the ability of farm families to master their machines. Nevertheless, in the middle decades of the century, farming peoples' practices of machine maintenance were a critical component of the production of industrialized agriculture as well as of their control over those systems.

PART TWO

Chapter Three

The Granger Movement of the 1870s: Farmer Cooperatives Challenge Systems of Machine Purchase and Distribution

In the midst of the turbulent grain and financial markets of the 1870s, farming people formed organizations of economic cooperation to defend their interests as producers. The leading institution in this farmers' movement was the Order of the Patrons of Husbandry. Colloquially called "the Grange" after its name for local chapters, this institution expanded rapidly across the Midwestern United States and Ontario in the early 1870s. Grangers championed farmers' agency within economic and technological systems through their conflicts with manufacturers and company agents. Particularly, they sought to upset and alter the balance of power within systems of machine purchase and distribution. In doing so, they encountered internal conflicts about how power should be formulated and used in an emerging corporate, and industrial, economy as well as difficulties of machine knowledge and maintenance. Ultimately, their efforts to address those difficulties were undermined by the opposition of leading firms in the industry, as well as by farmers' inability and unwillingness to take on roles performed by merchants and manufacturers within capitalist systems of machine distribution—thus leaving the path open for manufacturers and their agents to consolidate control of not only machine purchasing, but also of machine maintenance in later decades.

The Grange as an organization is perhaps best known for the farmers' cooperatives that characterized its efforts in the 1870s. These cooperatives were built

with the goal of leveraging the numbers of farmers to purchase manufactured goods at lower prices.⁵²⁶ Some scholars have pointed to the influence of the Granger movement on government policy, particularly concerning the regulation of railroads, while others focus instead on the social and educational functions of the Grange that continued for many decades after its height of activity in the mid-1870s.⁵²⁷ Scholars' characterization of Granger ideology has often lived in the shadow of scholarship on the Populist movement of the 1890s. Grangers have often been cast as the conservative forebears to the radical politics of the Farmers' Alliances and People's Party.⁵²⁸ Thomas A. Woods has inspired recent scholarship to understand the Grangers as more than a prologue to the Populists, but instead as progressive and significant in their own right. He characterizes the Grangers as liberal republicans with a serious anti-monopoly and democratic spirit born of both Jeffersonian republicanism and Jacksonian democracy. He also correctly identifies farm machines as powerful cultural symbols within those animating

⁵²⁶ Buck, *The Granger Movement*; Woods, *Knights of the Plow*; Bourne, *In Essentials Unity*; Hirsch, "Efforts of the Grange in the Middle West to Control the Price of Farm Machinery, 1870-1880,"; Cerny, "Cooperation in the Midwest in the Granger Era, 1869-1875"; Hurt, "The Ohio Grange, 1870-1900"; Scott, "Grangerism in Champaign County, Illinois, 1873-1877." For the Granger movement in the South, see, Theodore Saloutos, "The Grange in the South, 1870-1877," *Journal of Southern History* 19, no. 4 (1953): 473-87.

⁵²⁷ Miller, *Railroads and the Granger Laws*, describes how the activism of those years contributed to American regulatory policy; Nordin, *Rich Harvest*, highlights instead the institution's later and more conservative existence in the 1880s and 1890s; Warren J. Gates, "Modernization as a Function of An Agricultural Fair: The Great Grangers' Picnic Exhibition at Williams Grove, Pennsylvania, 1873-1916" 58, no. 3 (July 1984): 262-79, sees the Grange as an instrument of modernization, particularly in the Eastern region of the United States where the Grange experienced a resurgence in the later decades of the nineteenth century that continued into the twentieth century.

⁵²⁸ Lawrence Goodwyn, *Democratic Promise*, 44-46, casts the Grangers as the Populists' forerunners, yet also emphasizes the more conservative nature of the Grange to contrast with the later Populist movement. Hofstadter, *The Age of Reform*, 96, while less sympathetic to both Grangers and Populists, also casts the Grange as more conservative on the basis of Grangers' relative reluctance to enter into party politics.

ideologies.⁵²⁹ Farm machines were more than ideological symbols, however. They were among the most expensive items that Granger cooperatives sought to purchase, and certainly those most central to technological systems of industrial agriculture.

The significance of machines to the Granger movement lies in their status not only as consumer items, but also as tools of production. Scholars have debated the reasons for the rapid decline of the short-lived, but significant, Granger efforts at the cooperative purchase and distribution of farm machines.⁵³⁰ While most scholars agree that Granger cooperatives were undercapitalized and that Granger agents were inexperienced, recent scholars have also pointed to ideological conflicts within the Grange that undermined their larger-scale efforts.⁵³¹ Antimonopolist and producerist

⁵²⁹ Thomas A. Woods, *Knights of the Plow: Oliver H Kelley and the Origins of the Grange in Republican Ideology* (West Lafayette: Purdue University Press, 1991); Woods cites Kasson, *Civilizing the Machine*, on the connection of machines to republican ideology and culture; Blanke, *Sowing the American Dream*, 94-131, is among the recent scholarship inspired by Woods to re-evaluate the Grangers' significant contributions to American political and cultural life and casts their cooperative schemes as evidence of a rural consumer culture that was both communal and commercial; Blanke, 117-122, 221-225, also calls attention to the democratic character of Grange membership, being composed of many small and middling farmers.

⁵³⁰ Historians have noted the failure of the Grangers to replace the machine company agency system with their own in terms of the business, organizational, and technical abilities of the Grangers. Arthur Hirsch, "Efforts of the Grange in the Middle West to Control the Price of Farm Machinery," attributes these difficulties to the essential services provided by agents in assessing the creditworthiness of buyers and in setting machines up, as well as to farmers' and Grangers' inability to play those roles. Hirsch goes so far as to justify the positions of manufacturers like the McCormick company regarding the Grange; Buck, 274-275, also acknowledges the failures of the Grangers to replace agents, but does give the institution credit for causing price reductions across the board and points also to exogenous, structural difficulties like the difficulties of cooperation among isolated farmers and a lack of cash among them rather than simply their lack of business or technical knowledge; Cerny, 204, is likewise more sympathetic to the Grange and credits the effects of their efforts on overall prices and argues that if schemes based on the Rochdale plan had been implemented earlier they could have been more successful. For other accounts of the failure of Grange cooperative efforts, all of which emphasize the lack of business experience, central coordination, and capital available to state purchasing agencies, see, Nordin, 151-167; Margaret K. Andersen, "Agrarian Union: The Grange in the Midwest, 1870-1900" (Evanston, Northwestern University, 1989), 153-169; Colston Estley Warne, *The Consumer's Co-Operative Movement in Illinois* (Chicago: University of Chicago Press, 1926); Hurt, "The Ohio Grange."

⁵³¹ Wood, 147-164; Blanke, 161-183.

discomfort with the sales and financial side of machine distribution limited Grangers' abilities to build alternatives to manufacturers' systems of machine distribution.

Previous scholars of Grange cooperative efforts, however, have seldom gone beyond an analysis of how Grangers sought to purchase machines, but machine distribution included more than purchase and sale. This chapter concerns the ways in which Grangers dealt with machine knowledge and maintenance—the “middle ground” between production and consumption—in their efforts to reform systems of machine purchase and distribution.⁵³² Despite their claims as producers, Grangers were ultimately unable to imagine and create a farm machine industry with new roles and responsibilities for themselves beyond that of consumers. Their inability and unwillingness to address aspects of machine knowledge and maintenance that had been a part of the duties of manufacturers and their agents limited their ability to reform systems of machine purchase and distribution. While the technological systems farming people constructed required knowledge and maintenance as components alongside the machines themselves, Grangers were ultimately unable to incorporate those components into their efforts to assert control in the machine industry. Their failures to do so set the stage for manufacturers to take command not only of machine sales, but also of maintenance and repair, in the latter decades of the century. Nevertheless, the importance of machine knowledge and maintenance, alongside machine purchase, to the Granger movement demonstrates how farming people continued to contend with manufacturers and their

⁵³² On the “middle ground,” see, Borg, *Auto Mechanics*.

agents over claims to the production of the technological systems of industrial agriculture.

Granger Cooperatives

The Grangers sought to advance farmers' agency over their technological world. They believed that farmers must organize in a time in which they saw the emergence of large corporations and other amalgamations of capital.⁵³³ The Granger movement can thus be seen as an early attempt of farmers to understand and struggle for a place within an emerging corporate economy in the context of an unfavorable economic situation after the Panic of 1873.⁵³⁴ Some Grangers turned to electoral politics, particularly advocating against the extension of patents and for railroad regulation.⁵³⁵ Yet much of the Grangers' efforts were aimed at efforts to purchase farm machinery cooperatively. In their cooperative efforts, Grangers attempted to take some control of the farm machine

⁵³³ "Re-organization of the Illinois State Grange." *Prairie Farmer*, March 16, 1872, 31; "Shall We Organize." *Ohio Farmer*, vol. 44, no. 9, August 30, 1873, 134. ProQuest, American Periodicals Series II. <https://www-proquest-com.proxy.wm.edu/publication/35902?accountid=15053>.

⁵³⁴ On the growth of corporate capitalism in the third quarter of the nineteenth century, see, Robert E. Wright, "Capitalism and the Rise of the Corporate Nation," in *Capitalism Takes Command: The Social Transformation of Nineteenth Century America*, ed. Michael Zakim and Gary Kornblith (Chicago: University of Chicago Press, 2012), 145–68.

⁵³⁵ For Grange discussions about and activity in electoral politics, see, "The Farmers' Movement." *Prairie Farmer*, June 21, 1873, 194; "Can a Man Touch Pitch and not be Defited?" *Ohio Farmer*, vol. 44, September 6, 1873, 151; "A Reply from Lone Cedar Grange." *Farmers' Union*, June 13, 1874, p. 180; "Reply to Mr. Donnelly." *Farmers' Union*, June 20, 1874, p. 189; "Action of Wisconsin State Grange." *Prairie Farmer*, August 9, 1873, 251; "The Elections." *Prairie Farmer*, November 15, 1873, 363; Scott, "Grangerism in Champaign, County, Illinois, 1873-1877," 157; See also, Nordin, 168-182; Buck, 84-122; Blanke, 110-111.

industry away from those they considered middlemen and monopolists. To do so, they built an institution comprised of local, state, and national levels where they fought to control purchase and distribution systems.

The economic conditions of the mid-1870s left many farmers in more precarious conditions than those which had defined the middle years of the century. Farmers had become more thoroughly enmeshed in capitalist relations of credit and debt. A western mortgage market emerged during this decade in which British and Northeastern banks and investors sold and purchased farm mortgages as “debenture bonds,” which are today know as mortgage-backed securities. Banks in the Midwest would enter into mortgage agreements with farmers and then broker the whole loan to investors in the Northeast and in Europe, effectively offering the opportunity to invest in Midwestern farms. The rate of western farms that were mortgaged and debentured only increased in the decades to follow. While most farmers purchased machines on credit from machine companies—rather than credit from banks—the prevalence of mortgages contributed both to farmers’ inability to tolerate any loss as well as to their distrust of the non-producing classes and the economy of circulation. While farming people in the Midwest and Ontario became more dependent on Eastern credit to establish and operate, the Panic of 1873 also made this credit harder to get and made the rates of available credit worse for farmers. Under these conditions of tighter credit, farmers were placed in greater economic precarity as banks felt greater pressure to collect on their existing loans without delay. Farmers throughout the American Midwest and Ontario also felt the effects of the Panic on the

availability of currency as money itself became difficult to come by and the dollar began a deflationary trend.

Farmers had little choice but to rely even more on machines at the same time that machines were a potential source of higher costs and greater losses. Farmers competed to sell their crops in a market that was competitive internationally as new regions of the world began producing significant crops of wheat. The need to pay off mortgages as well as to pay for standing costs—including previously-purchased machinery—pushed farmers to produce wheat no matter the prices. This need to produce despite demand led to unstable prices. While machines were sunk costs, they could be quite risky purchases as well, due to the possibility of breakage. In addition to purchase price, machines also had to be shipped—often via railroads that were themselves consolidating into large enterprises with high costs of operation and high freight prices. Farmers thus produced more wheat to pay for more machines and exacerbated the cycle of overproduction and precarity with little ability to financially survive bad harvests. Moreover, the effects of the Panic of 1873 were accompanied by adverse natural conditions like drought and grasshoppers in the upper Midwest and central prairie regions.⁵³⁶ There were plenty of possible reasons for loss in the mid-1870s. It was in these conditions that farming people turned to the Grange as an organized conduit of their social and economic interests. Farmers hoped to ameliorate the losses that came from expensive machinery and set about through the Grange to seek lower prices. They also were aware of their own

⁵³⁶ Levy, *Ages of American Capitalism*, 249-254; Fite, 55-74.

position within these emerging markets and credit systems and demanded some control over systems of machine distribution as a recognition of their status as equal contributors to the progress of agriculture.

Machine companies and agents also experienced difficulties in the 1870s, thanks to the difficulties brought to their sales and collections processes by the Panic of 1873, as well as from other conditions like grasshoppers and drought. McCormick company agents reported on their difficulties selling and collecting in the mid-1870s, as well as on competition from other manufacturers like the Marsh brothers of Plano, Illinois.⁵³⁷ These conditions left both farmers and manufacturers with less tolerance for loss and set the stage for conflict between them.

The Grangers organized on local, state, and national levels and each developed different goals and capacities over the course of the 1870s. The Grange originated at the national level in Washington, D.C., before a single local Grange had been organized. The founders and officers of the National Grange were reform-minded professional civil servants. The man heralded as the Founder of the Grange, Oliver Hudson Kelly, worked for the United States Bureau of Agriculture after the Civil War. He made connections with a small group of like-minded bureaucrats in other government departments, including the Post Office, who envisioned a national organization for farmers. In 1867, they

⁵³⁷ A. C. Palmer to Cyrus Hall McCormick, "Preliminary Report of A. C. Palmer: Fairmont, Nebraska," 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence; J. H. Matthews to Cyrus Hall McCormick, August 11, 1875, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

founded the National Grange of the Order of the Patrons of Husbandry.⁵³⁸ Local and state “Granges” served as the Order’s organizing unit at the state and local level as well. The National Grange passed on two key characteristics to all local and state Granges. The first was the status of all as “secret” organizations with a ritual component, which founders believed would bolster the social cohesion of the Grange as well as facilitate economic cooperation by allowing Granges to deal with manufacturers in secret.⁵³⁹ Second, the National Grange mandated the admission of women as equal members, though their activities within local, state, and national Granges usually conformed to standards of respectable domesticity.⁵⁴⁰ Both secrecy and the admission of women gave some farmers reason to object to the Grange. Some farmers chose to join independent farmers’ clubs over the Grange due to religious objections to secrecy and ritual.⁵⁴¹ Some clubs also allowed farm women to organize separately from farm men.⁵⁴² In practice, independent

⁵³⁸ William D. Barns, “Oliver Hudson Kelley and the Genesis of the Grange: A Reappraisal,” *Agricultural History* 41, no. 3 (July 1967): 229–42. D. Wyatt Aiken, *The Grange: Its Origin, Progress and Educational Purposes*. Read Before a Convention called by the Commissioner of Agriculture, January 23, 1883. (Washington: GPO, 1883), 1-3.

⁵³⁹ The importance of secrecy for dealing with manufacturers was for the purposes of protection for manufacturers who might choose to deal with the Grange from the disapproval of their fellow capitalists and of keeping “confidential” prices offered to particular Granges from consumers at large. See Aiken, 10-12.

⁵⁴⁰ “History of the Order.” *Prairie Farmer*, September 6, 1873, 283; Aiken, 14, asserted that this stance on the place of women within the Grange sometimes put it in contention with rural sensibilities, especially in the South. For scholarship on women’s involvement in and shaping of the Grange, see, Donald B. Marti, “Sisters of the Grange: Rural Feminism in the Late Nineteenth Century,” *Agricultural History* 58, no. 3 (July 1984): 247–61; Margaret K. Andersen, “Agrarian Union: The Grange in the Midwest, 1870-1900” (Evanston, Northwestern University, 1989), 32-73.

⁵⁴¹ “Club or Grange, Which?” *Prairie Farmer*, June 21, 1873, 195; “A Feminine View of the Grange.” *Ohio Farmer*, April 24, vol. 47, no. 1, 1875, 263; M. E. Gustin, *An Expose of the Grangers* (Dayton, OH: Christian Publishing Association, 1875). For more on religious objections to the Grange as a secret organization, see, O. Fritiof Ander, “The Immigrant Church and the Patrons of Husbandry,” *Agricultural History* 8, no. 4 (October 1934): 155–68.

⁵⁴² “Farmers’ Wives Club.” *Farmers’ Union*, July 11, 1872, 3; “Farmer’s Club for Women.” *Prairie Farmer*, February 8, 1873, 41.

farmers' clubs often worked closely with Granges, as they would come to do with the State Grange of Illinois under the umbrella organization called the State Farmers' Association.⁵⁴³ The National Grange undertook a number of initiatives throughout the early 1870s, but many of them were aimed at facilitating the organization of new local and state Granges, and especially of forming institutions of cooperative selling and purchasing at the local and state level.⁵⁴⁴

Local Granges, peopled and led by ordinary farmers, were central to efforts to assert control over the purchase of farm machines took place. Representatives of the National Grange quickly set about organizing local Granges, especially in the Midwest, in the late 1860s and early 1870s.⁵⁴⁵ Local Granges could take the form of Granges that covered very particular localities, but they sometimes also formed wider county councils or Pomona Granges that united counties or other locals together. By 1873, Wyatt Aiken reported that 8,668 subordinate Granges were organized in that year alone, and 11,941 followed in 1874.⁵⁴⁶ While the formation of local Granges in Ontario lagged behind the United States, hundreds were founded in the middle years of the decade. A writer for the

⁵⁴³ Edward Winslow Martin (pseud. of James Dabney McCabe). *History of the Grange Movement; or, The Farmer's War Against Monopolies* (Philadelphia: National Publishing Company, 1873), 360-62.

⁵⁴⁴ Buck, 142, 239-278; Aiken, 14.

⁵⁴⁵ "The Patrons of Husbandry: Constitution of the Order." *Prairie Farmer*, April 16, 1870, 117; "Patrons of Husbandry." *Colman's Rural World*, February 13, 1869, 99. Ebscohost. American Antiquarian Society, Historical Periodicals Collection, Series 5.

<https://web.p.ebscohost.com/ehost/command/detail?vid=0&sid=6b10effc-a244-4dcb-bb75-57a926d66465%40redis&bdata=JkF1dGhUeXBIPWNvb2tpZSxpcCx1cmwsc2hpYiZzaXRIPWVob3N0LWxpdmUmc2NvcGU9c2l0ZQ%3d%3d#jid=6EMJ&db=h9m>; "Organizing a Farmer's Club." *Prairie Farmer*, January 27, 1872, 25; "Farmer's Meetings." *Prairie Farmer*, March 1, 1873, 68; "Granges in Illinois." *Prairie Farmer*, April 5, 1873, 108; "New Granges in Illinois." *Prairie Farmer*, August 1873, 243; "Number of Granges." *Prairie Farmer*, November 8, 1873, 355; "The Granges in Ohio." *Ohio Farmer*, vol. 44, no. 24, December 13, 1873, 375.

⁵⁴⁶ Aiken, 7-9.

Ontario-based *Farmer's Advocate* was impressed by the 6-8 million members they reported among the Granges in the United States in late 1874.⁵⁴⁷ While there had been only a handful of subordinate Granges in Canada at the beginning of 1874, there were nearly two hundred and fifty by the end of 1875 and more than five hundred by the end of 1876.⁵⁴⁸

Local Granges initially sought to establish new systems of machine purchase from manufactures through a contract system in which locally elected or appointed purchasing agents placed orders for multiple machines on behalf of their members. These purchasing agents were often farmers. Nearly all local purchasing agents in Illinois were farmers and likely were simply active members appointed by their fellows.⁵⁴⁹ In the early 1870s, local Granges reported successes in dealing with small manufacturers for purchases.⁵⁵⁰ Independent farmers' clubs did so through their newly appointed purchasing agents as well.⁵⁵¹ Yet many local Granges did not establish their own local agencies until 1874 and 1875. Because the organizing effort in Canada began after that in the United States, few Canadian Granges did much in the way of cooperative purchasing until 1875, though

⁵⁴⁷ "Grange Items." *Farmer's Advocate*, vol. 9, no. 11, November 1874, 164. Canadiana Online. https://www.canadiana.ca/view/oocihm.8_06503.

⁵⁴⁸ Patrons of Husbandry. *Farmer's Advocate*, vol 10, no. 12, December 1875, 223; "New Granges." *Farmer's Advocate*, vol. 11, no. 12, December 1876, 224.

⁵⁴⁹ A list of state purchasing agents in Illinois can be found in "Grange Purchasing Agents of Illinois." *Prairie Farmer*, March 20, 1875, 92. These names were checked against United States Censuses for 1870 and 1880 made available through Ancestry.com. Of the twenty-seven agents listed, two were merchants, three could not be identified, one appears to have been a farm wife, and twenty were farmers. One was a farm worker in 1870 and a store clerk in 1880.

⁵⁵⁰ "The Patrons of Husbandry in Indiana." *Prairie Farmer*, April 6, 1872, 106; "Farmers' Organizations." *Prairie Farmer*, December 7, 1872, 336.

⁵⁵¹ "A Purchasing Agent." *Prairie Farmer*, January 18, 1873, 18.

Grangers in Ontario discussed the possibility in 1874.⁵⁵² Local Grange purchasing agents would persist as a possible method of cooperation throughout the 1870s.

During the same time that farmers organized local Granges throughout the Midwest and Ontario, they also organized state Granges and the Canadian “Dominion Grange.”⁵⁵³ These state Granges organized the cooperative enterprises that undertook business on the largest scale of any type of Grange, especially in 1874 and 1875.

Different states operated their state agencies on different principles. Some were more concerned with simply facilitating purchases from farmers to manufacturers through the state agent while others placed the Grange itself in the position of a purchaser.⁵⁵⁴ They often issued circulars of prices made available by certain firms to Grangers that were meant to be kept secret by the members of the order.⁵⁵⁵ By the end of 1874, purchasing agents had been appointed by state Granges in twenty-six states, including every Midwestern state apart from the still sparsely-populated Dakota territory.⁵⁵⁶ State agents likely had more business experience than their local counterparts and certainly did business on a larger scale and with larger salaries. Several state agencies claimed

⁵⁵² Patrons of Husbandry. *Farmer's Advocate*, vol. 9, no. 4, April 1874, 57.

⁵⁵³ The Dominion Grange became fully independent of the U.S.-based National Grange in 1874, but functionally acted much like an American state Grange in its relationship with Canadian local Granges. See, “The Grangers.” *Farmer's Advocate*, vol. 9, no. 10, October 1874, 149.

⁵⁵⁴ Buck, 239-255, gives a more comprehensive overview of the different financial mechanisms of state agencies.

⁵⁵⁵ Aiken, 12, goes so far as to list the inability of Grangers to keep the prices offered to them a secret among the failures of the Grange; See also, “State Agent’s Circular Notice.” *Grange Advance*, December 8, 1873, 6; “Letter from Ohio Business Agency.” *Ohio Farmer*, vol. 49, no. 13, April 1, 1876, 199.

⁵⁵⁶ Several states listed more than one active state agent, but these were Southern states where the agencies themselves were not particularly successful. Midwestern states were represented by a single agent each, indicating their construction of statewide systems under the state agents. “State Agents.” *Prairie Farmer*, December 26, 1874, p. 411; See also, Cerny, 188; Buck, 241.

substantial successful cost savings. By the middle years of the decade the successful construction of farmer-led systems of machine purchase and distribution seemed imminent.⁵⁵⁷

State agencies did a greater volume of business than local agencies, but they had little control over the actions of local agencies or of individual Grangers. The Grange did not take advantage of the possibilities of coordinating action at every level. In fact, the mandate of appointed state purchasing agents was not primarily to construct state business agencies, but also to assist local purchasing agents however possible.⁵⁵⁸ Local purchasing agents were also under no obligation to patronize state agencies and were instead free to make deals with any manufacturers that local itself had not resolved to avoid. Illinois state purchasing agent, S. J. Frew, for instance, struggled to coordinate between all of the newly organized local Granges as well as the purchasing arrangements set up by preexisting local Granges.⁵⁵⁹ Yet there was support for Frew's efforts in Clay County, where the local Grange passed a resolution to "stand by our purchasing agent in the discharge of his duties."⁵⁶⁰ Frew called meetings of all Grange purchasing agents and issued new directions to them multiple times over the two years in his efforts to centralize

⁵⁵⁷ J. S. Denman. "Purchasing Tools-A State Agent Speaks." *Prairie Farmer*, November 8, 1873, 355; See also, "The Purchasing Agency." *Grange Advance*, November 12, 1873, 8; *Journal of Proceedings of the Third Annual Session of the Ohio State Grange* (Sandusky Register Steam Printing Establishment, 1876), 39; "Some Hints on Business Matters." *Prairie Farmer*, May 9, 1874, 147; "From the State Grange Purchasing Agency." *Prairie Farmer*, September 5, 1874, 283; Patrons of Husbandry. *Prairie Farmer*, July 3, 1875, 211; "Notes from the Granges." *Prairie Farmer*, July 24, 1875, 235; "Letter from Ohio Business Agency." *Ohio Farmer*, vol. 49, no. 13, April 1, 1876, 199.

⁵⁵⁸ J. S. Denman. "Purchasing Tools-A State Agent Speaks." *Prairie Farmer*, November 8, 1873, 355; "The Purchasing Agency." *Grange Advance*, November 12, 1873, 8.

⁵⁵⁹ "Some Hints on Business Matters." *Prairie Farmer*, May 9, 1874, 147.

⁵⁶⁰ "A New County Grange." *Prairie Farmer*, August 8, 1874, 251.

and organize the Illinois purchasing system, emphasizing the cost-savings and negotiating power that purchasing at scale could bring.⁵⁶¹ Other state agents warned that a lack of “unity of action” would doom their efforts.⁵⁶² State agents also complained, just as machine company agents before them, about farmers’ practices of delaying orders until late in the season.⁵⁶³ What was a successful strategy of risk amelioration for individual farmers proved a liability for their own organizations. State Granges thus struggled to implement large-scale cooperative plans in an institution largely driven by the activities of local Granges.

While state Grange agencies occupied the attention of the National Grange and were the center of Granger cooperative efforts in 1873 and 1874, by 1875 the National Grange and many local Granges instead turned back to local agencies, this time attached to cooperative stores. The National Grange, along with some leadership of local and state Granges, began advocating the establishment of local cooperative stores on the Rochdale plan of English cooperatives. Some of these Grange stores continued for decades afterwards, but overall the membership of the Grange declined after 1875 and the political and economic functions of the Grange became less central than its social aspects.⁵⁶⁴ While the height of Grange cooperative efforts were short-lived, they

⁵⁶¹ “A Meeting of Purchasing Agents.” *Prairie Farmer*, November 28, 1874, 379; “Notice to Illinois Granges.” *Prairie Farmer*, February 13, 1875, 51.

⁵⁶² “Meeting of Wisconsin State Grange.” *Prairie Farmer*, January 31, 1874, 35; “Some Hints on Business Matters.” *Prairie Farmer*, May 9, 1874, 147; *First Annual Proceedings of the Michigan State Grange* (Published by Michigan State Grange, Patrons of Husbandry, 1874), 11-12.

⁵⁶³ “State Agency of Patrons.” *Prairie Farmer*, July 25, 1874, 235; “State Agent’s Department.” *Grange Visitor*, June 1877, vol. 3, no. 3, p. 5. Michigan State University, Digital Repository.

<https://d.lib.msu.edu/grange>; Hurt, “The Ohio Grange,” 25.

⁵⁶⁴ Buck, 69-73, 260-266.

nonetheless were taken quite seriously by the parties who had most to lose in their success. Grangers inaugurated a conflict with merchants and manufacturers over their claims as the producers of technological systems of mechanized agriculture.

Conflict with the Middlemen and Monopolists

Grangers struggled with merchants and manufacturers for control of the systems of machine purchase and distribution. Granger cooperative efforts thus also experienced difficulties at the hands of the enemies they made among manufacturers and their agents. Farmers were aware that they entered the marketplace with machine sellers on unequal terms due to the scarcity of cash as well as their dependence on machinery and cash crops to pay mortgages. The leading firms of the industry worked to undermine Granger cooperative efforts as each side struggled for control of the systems of industrial agriculture.

Grangers considered farmers to be the producers of mechanized agriculture and carried also producerist distrust of non-producing business agents. Suspicion of those who made their living in the economy of circulation, rather than in the economy of production, was a defining feature of Granger rhetoric in the 1870s. One Granger lamented that farmers had to pay “the Dutchman’s one per cent” when purchasing their farm machines and implements from “middlemen,” like the agents of machine

manufacturers.⁵⁶⁵ Farmers' clubs also considered the middlemen to be their enemies. Upon its organization in 1873, the Radnor Farmer's Club in Illinois declared itself "against those naughty grabbers—the middlemen and monopolists."⁵⁶⁶ An 1873 article condemned agents for making twenty percent profits on machine sales.⁵⁶⁷ Others cast company agents as peddlers.⁵⁶⁸ So thoroughly had the Grange identified these agents and middlemen as their enemies in the early 1870s that one Granger listed sympathy for a relative who worked as a machine company agent as a reason that some farmers might not support the Grange.⁵⁶⁹

While some agents were closely connected to farming communities, or were themselves farmers, the growth of company agency systems and the conflict of the 1870s drew a greater divide between farmers and company agents. A farmer from Lucas County, Ohio, wrote to the *Ohio Farmer* with a story of a farmer-agent who made "a snug little profit of one thousand dollars—the result of a little of his spare time and smooth talking" in his sale of reapers along with other implements.⁵⁷⁰ Farming people located the value produced on the farm, even under systems of mechanized agriculture, in the labor done on the farm and argued for their own primacy in those systems based on their labor of producing both crops and the technological systems of farming themselves.

⁵⁶⁵ "Re-organization of the Illinois State Grange." *Prairie Farmer*, March 16, 1872, 31.

⁵⁶⁶ "Farmer's Club of Radnor." *Prairie Farmer*, April 26, 1873, 131.

⁵⁶⁷ "Cause of the Movement." *Prairie Farmer*, July 12, 1873, 217.

⁵⁶⁸ "The Grange and Middlemen." *Ohio Farmer*, vol. 48, no. 13, September 25, 1875, 199; "Our Madison Co. Farmers' Club Paper." *Prairie Farmer*, May 8, 1875, 147; On the cultural place of the peddler in nineteenth-century America, see also, T.J. Jackson Lears, *Fables of Abundance: A Cultural History of Advertising in America* (Basic Books: New York, 1994), 63-74.

⁵⁶⁹ "Open Sessions of the Grange." *Prairie Farmer*, March 27, 1875, 99.

⁵⁷⁰ "Lucas County, O." *Ohio Farmer*, vol. 47, no. 17, April 24, 1875, 263.

Grangers also criticized manufacturers for the extent to which they reaped the profit of mechanized agriculture despite the farmer's own contributions. Daniel Ott has demonstrated how the McCormick company sought to weaponize the history of its founding and the invention of the reaper to cast itself as a benefactor to farmers, as well as to cast farmers themselves as capitalists with aligned interests to those of manufacturers, in response to the demands of farmers.⁵⁷¹ Grangers themselves sometimes claimed to seek closer union between farmers and manufacturers. When they approached manufacturers in early years, they did so with requests for information about how the industry worked and why the prices of their machines were so high. An article from the *Prairie Farmer* states, "all we ask for is light in this implement business." However, the article also noted that farmers did not trust the "associations of manufacturers" which met and agreed upon increased prices.⁵⁷² As their efforts continued, Grangers would state outright that farmers were in conflict with manufacturers.

Grangers also accused manufacturers of profiting unjustly from the monopoly and rentier privilege of an unjust patent system. Granges and Grange-friendly newspapers condemned particular patent-extension decisions as well as the tendency of the system to favor manufacturers over purchasers.⁵⁷³ A contributor to the *Ohio Farmer* argued that

⁵⁷¹ Ott, "Producing a Past: McCormick Harvester and Producer Populists in the 1890s," *Agricultural History* 88, no. 1 (January 2014): 87–119; Ott, "Producing a Past: Cyrus McCormick's Reaper from Heritage to History," PhD diss., (Chicago, Loyola University, 2015), 69-117.

⁵⁷² "Increase in Price of Farm Implements." *Prairie Farmer*, March 8, 1873, 76.

⁵⁷³ "Monopoly-The Extension of Patents." *Prairie Farmer*, September 20, 1873, 297; "A Nebraska Grange Speaks." *Prairie Farmer*, October 25, 1873, 339; "The Patrons and Patents." *Prairie Farmer*, March 21, 1874, 91; See also, "The Grangers and Patents." *Prairie Farmer*. February 28, 1874, 67.

“everything a farmer uses now, is patented (...) and the patents are renewed as fast as they run out, so that a continual onerous tax is paid to the patentee, on every article in use.”⁵⁷⁴ The National Grange petitioned Congress to pass legislation mandating that patent-holders must accept a “reasonable royalty” for the manufacture and use of any item. They also advocated for the protection of the consumer from patent litigation.⁵⁷⁵ Even in the later years of the 1870s, Grangers continued to petition congress about particular patent extensions.⁵⁷⁶ Grangers knew that their own command of their technological world was limited by the legal and political systems of patent management.⁵⁷⁷ Their criticisms took aim at one of the political and legal tools through which manufacturers claimed an unjust proportion of the rewards of mechanized agriculture.

Grangers differed among themselves over the extent to which ordinary farmers were, or ought to be, at odds with manufacturers as capitalists. Some Grangers asserted that labor and capital ought to cooperate as fellow producers.⁵⁷⁸ Others asserted that the capitalists only sought their own profit at the expense of labor and that it was the duty of working men, including farmers, to stand for the rights and dignity of labor. A lecturer

⁵⁷⁴ “Patent Rights.” *Ohio Farmer*, vol. 47, no. 24, June 12, 1875, 375.

⁵⁷⁵ Buck, 120-121.

⁵⁷⁶ “Resolutions on Patent Rights.” *Grange Visitor*, January 15, 1878. Vol. 4, no. 1, p. 3. Michigan State University, Digital Repository. <https://d.lib.msu.edu/grange>; “An Address by A.N. Russell of Burr Oak Grange no. 303.” *Grange Visitor*, March 1, 1878, vol. 4, no. 5, p. 5-6.

⁵⁷⁷ For the ways in which manufacturers participated in the social, legal, and economic process of patent management, see Carolyn C. Cooper, “Social Construction of Invention through Patent Management: Thomas Blanchard’s Woodworking Machinery,” *Technology and Culture* 32, no. 4 (October 1991): 960–98.

⁵⁷⁸ “Labor and Capital.” *Farmers’ Union*, June 8, 1872, 2.

for the North Star Grange—the first organized in Minnesota—spoke on the subject in 1870 and asserted that “capital controls labor and capitalists are doing all they can do to make labor degrading,” and continued, “it is one of the objects of this Grange to enoble [sic] labor and protect our interests against the extortions of capital.”⁵⁷⁹ Whether individual Grangers championed a producerist view of the unity of interests between producers or saw an increasing conflict between large capitalists and producers like themselves, they all criticized the inequity of manufacturers’ profits. McCormick company agent G. W. Russell wrote about “two large Grange public gatherings wherein the speakers announced that C. H. McCormick was in court that his machine cost him \$50 each.”⁵⁸⁰ This claim that machines that McCormick sold for anywhere between one hundred and three hundred dollars could cost so little to manufacture became widely circulated elsewhere as proof that companies like McCormick were making much more than a fair profit at the expense of farming families. In 1875, the *Ohio Farmer* ran an article claiming McCormick testified to the same effect and also included information from the *Scientific American* that “the sewing machines that are usually sold from \$65 to \$125, cost from seven to fifteen to manufacture, the average cost being eleven dollars and eighty two cents.”⁵⁸¹ Russell later complained to McCormick that farmers were

⁵⁷⁹ Doris Taylor and Selma Larsen, eds., “Minutes of North Star Grange, St. Paul,” 1868-1884, P2579, pg. 71, North Star Grange, Minutes of Meetings, Minnesota Historical Society; See also, “The Forth at Featherstone.” *Grange Advance*, July 11, 1876, pg. 5.

⁵⁸⁰ G. W. Russell to Cyrus Hall McCormick, January 15, 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

⁵⁸¹ “Too Much Toll.” *Ohio Farmer*, vol. 68, no. 2, November 13, 1875, 311.

convinced that nothing more than \$100 could be considered a fair price for harvesters.⁵⁸² Farmers thus had an idea of a just price for machines, and an idea of a just profit that manufacturers might take in their endeavors. Yet they were convinced that manufacturers' profits far exceeded that level at the expense of farmers.

Though farmers themselves were hard at work bringing industrial capitalism to the farm, they nonetheless opened ideological conflict with manufacturing capitalists about its development. Leading manufacturers defended the place of themselves and their agents atop the systems of machine purchase and distribution that had arisen by the 1870s. McCormick issued advertisements and posters to defend agents based on their connection to the manufacturer. One read, "A. S. Johnson is not a Middle-Man, but is employed by us on salary to look after our interests."⁵⁸³ Many agents were, however, paid on commissions. It is quite possible that even Johnson's sub-agents were paid in that manner. Yet in identifying Johnson as a salaried employee, McCormick sought to convince Grangers that in dealing with him, they were dealing directly with the manufacturer. McCormick issued further circulars in response to inquiries about whether they would "deal directly" with Granges and clubs. These circulars defended the honesty of their agents, but also said the company would be willing to sell directly to individual farmers, or through the company's own agents to clubs and Granges. They asserted,

⁵⁸² G. W. Russell to Cyrus Hall McCormick, May 12, 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

⁵⁸³ Cyrus Hall McCormick, "A Word to Farmers and Grangers," n.d., McCormick Mss 5X, Box 1, Folder 2., McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society.

however, that they would go through no agents other than their own.⁵⁸⁴ Grangers and club members took notice of similar responses from a number of machine manufacturers.⁵⁸⁵

Manufacturers asserted the claims of their agents to space in the system of machine purchasing to ensure exclusive control of their products from manufacture to retail.

McCormick agents also responded to Grangers' challenges by asserting their own contributions to mechanized agriculture and stood with the company against Grange efforts.⁵⁸⁶ McCormick agent John Shaffer expressed his view that the leaders of the Grange in his vicinity were dishonest.⁵⁸⁷ Others thought that the success of the Grange would harm their business. S. Ruble, a McCormick agent, wrote of his hope that "the Grange business does not interfere with my business."⁵⁸⁸ Others doubted the Grangers were organized enough to cause trouble. D.H. Smith described them as small, unorganized, and composed of only poor farmers.⁵⁸⁹ Dealer-agents particularly despised the Granger movement, as dealers were decidedly among the "middlemen" that the Grangers hoped to eliminate. S. Ruble, a dealer-agent, wrote, "The Grange business is

⁵⁸⁴ "The Farmers' Grange Movement," 1874, McCormick Mss 5X, Box 2, Folder 1., McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society.

⁵⁸⁵ "The Farmers and Middle Men." *Prairie Farmer*, January 25, 1873, 25.

⁵⁸⁶ Ott, "Producing a Past: McCormick Harvester and Producer Populists in the 1890s," *Agricultural History* 88, no. 1 (January 2014): 87-119; Ott, "Producing a Past: Cyrus McCormick's Reaper from Heritage to History" (Chicago, Loyola University, 2014), 69-117, calls attention to the contention between manufacturers, their agents, and farmers. Olivier Zunz, "Making American Corporate," 156-160, takes a contrary perspective and focuses instead on the continued collaboration between agents and farmers even in the contentious 1870s.

⁵⁸⁷ John R. Shaffer to Cyrus Hall McCormick, January 13, 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

⁵⁸⁸ S. Ruble to Cyrus Hall McCormick, June 19, 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

⁵⁸⁹ D. H. Smith to Cyrus Hall McCormick, January 17, 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

raging high and the farmers tell me that the Grange have your Price list from the shop offering to sell the Prize mower at \$85 and of course would not buy of me.” It is difficult to ascertain what price list the Grangers referred to, but perhaps they figured the factory price based on information they received about the costs of manufacture.⁵⁹⁰ The rumblings of dealer-agents gave McCormick more reason to fear the growing Grange and to resist it. Agents and Grangers quickly took different views of the farm machine industry as manufacturers rallied against the challenges it posed to their systems of purchase and distribution.

Leading manufacturers in the industry recognized the challenge the Grangers posed to the balance of power within systems of machine distribution. The Marsh brothers of Plano, Illinois, joined McCormick in steadfast refusal to work with Grange agents. Minnesota purchasing agent, J.S. Denman, reported that the Marsh brothers were the only manufacturers who treated him poorly out of the gate due to the fact that they “think the northwestern states can’t live without them, and therefore will not give any reduced rates.”⁵⁹¹ The Marsh harvester was an incredibly successful machine at the time and a predecessor of the automatic binders that ruled the harvest by the end of the 1870s. Its design included a platform for men to stand on while binding. Binders thus no longer had to follow the machine but could instead ride atop it. The labor itself was conditioned

⁵⁹⁰ S. Ruble to Cyrus Hall McCormick, June 19, 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

⁵⁹¹ J. S. Denman. “Purchasing Tools-A State Agent Speaks.” *Prairie Farmer*, November 8, 1873, 355. Denman succeeded a previous state agent in Minnesota, but the structure of the state agency system was built in his tenure; See also, “The Purchasing Agency.” *Grange Advance*, November 12, 1873, 8.

by the intensity of having the pace determined by the machine as cut grain fell onto the binders' platform as the machine went forward.⁵⁹² This machine achieved popularity in the late 1860s and early 1870s and was at the forefront of the harvester industry by the time the Grangers inaugurated their conflicts with manufacturers.

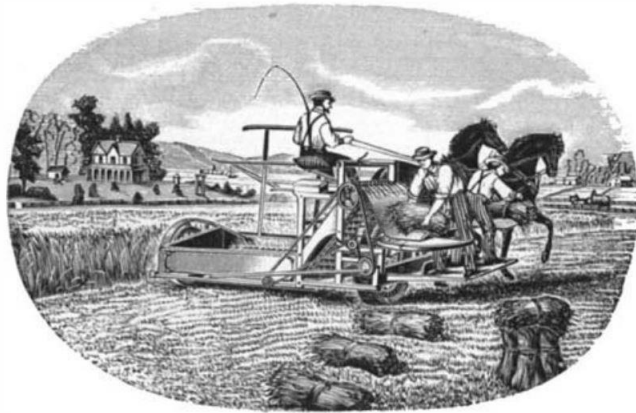


Figure 11: A depiction of a Marsh harvester in operation. The binders stand on the platform beside the machine and the driver sits in an elevated position. In later years, automatic binding attachments were a common addition to this style of "elevated" harvester. "Agricultural Machinery." Scientific American, July 25, 1896, 74-76.

Some Grangers made efforts to get leading firms to cooperate with their agencies. Grange agents wrote directly to McCormick asking him to cut his prices and deal with the Grange, while individual Grangers themselves wrote in asking for his "factory prices" as well.⁵⁹³ Some local Granges even claimed some success in these efforts. The Hancock County Grange of Illinois, for instance, claimed to have offers from "leading manufactures to sell us implements at greatly reduced prices, for cash," including reapers,

⁵⁹² Ardrey, 58-61.

⁵⁹³ Parmlee and Hurd, Grange Agency, May 9, 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

mowers, threshers, grain drills, and sewing machines.⁵⁹⁴ Other Granges and Clubs passed resolutions to boycott those firms that refused to work with them.⁵⁹⁵ But for the greater part, the titans of the industry, who controlled large systems of machine distribution, were able to stay committed to their avoidance of the Grange.

Cooperative efforts faced organizational challenges resulting from their conflicts with manufacturers and their agents. Some of these challenges resulted from Grangers' lack of experience in, or organizational capacity for, commercial business enterprise. For instance, Grange agents struggled to ascertain overall demand for machines in a given area, let alone how many farmers would purchase through the Grange.⁵⁹⁶ This was the kind of business information that company agents would cultivate by canvassing their territories, or comparing previous years. Some Grangers did attempt to canvass in the middle years of the decade, but they nonetheless struggled to accurately predict demand.⁵⁹⁷

Grange cooperatives also struggled to respond to manufacturers strategies of price-undercutting. When Grange agencies at the local or state level posed enough of a threat, manufacturers began to lower their general prices. Grangers sometimes viewed these savings as a victory. One article read, "When the agents saw we were beginning to deal direct with manufacturers they began to put their prices down endeavoring to run us

⁵⁹⁴ "To the Farmers of Hancock and Adjoining Counties." *Prairie Farmer*, February 15, 1873, 52.

⁵⁹⁵ "The Farmers and Middle Men." *Prairie Farmer*, January 25, 1873, 25; *Minutes of North Star Grange*, 187.

⁵⁹⁶ "Indiana State Grange." *Prairie Farmer*, December 12, 1874, 395.

⁵⁹⁷ "Iberia Grange No. 129." *Farmers' Union*, January 17, 1874, 437.

out, and in this way there was a great savings to the whole country, which the farmers hugely enjoyed.”⁵⁹⁸ Some manufacturers, like the McCormick Company, did their best to avoid this price drop, but at least one of their agents later regretted the decision to hold out as doing so may have cost the company more in sales.⁵⁹⁹ Other McCormick agents did not hold and actually did lower prices.⁶⁰⁰ Yet price drops were a double-edged sword for Grange efforts. Even when Grangers managed to force manufacturers to lower prices, those lower prices often came at the expense of state agency systems. The state purchasing agency for the Wisconsin Grange was still doing \$100,000 worth of business in 1876, but manufacturers wanted definite numbers of orders for the upcoming harvest. Grange agents could have difficulty making these predictions. The agent ordered one hundred harvesters but was unable to find buyers for all of them thanks to price cutting from regular manufacturers:

The revenue to the Agency from the sale of these harvesters, was not as large as I expected, owing largely to the competition met at every point, with agents of other machines. The regular price of harvesters was nominally at \$175 and freight. Wherever the Grange machine had prospect of a sale, price appeared to be no object to our competitors, and I have seen the Marsh, Elward and McCormick brought from \$175 and freight, down to \$122 and \$125, and freight paid by manufacturer, and sold on time at that. Thus the indirect benefit of the Grange, so familiar to us all, came prominently to the front in this harvester transaction.⁶⁰¹

⁵⁹⁸ “The Business Feature of It.” *Prairie Farmer*, January 10, 1874, 11.

⁵⁹⁹ John Edgar to Cyrus Hall McCormick August 16, 1873, McCormick Mss 1A, Box 48, C.H.M. Correspondence.

⁶⁰⁰ G. W. Russell to Cyrus Hall McCormick, January 15, 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

⁶⁰¹ *Proceedings of the Fifth Annual Meeting of the Wisconsin State Grange, Patrons of Husbandry* (Milwaukee: Sentinel Company, 1877), 15-19.

The North Star Grange of St. Paul, Minnesota, passed a resolution that directed their members not to buy from manufacturers who engaged in this price-cutting and asserted that these actions amounted to “efforts to destroy our Agency system.”⁶⁰² Grangers took credit for bringing this price-cutting into effect, and Aiken bragged that these price changes often lasted a while, but they did damage to the systems of purchase and distribution that Grangers attempted to build in opposition to those of manufacturers.⁶⁰³ Manufacturers found a powerful weapon against purchasing agencies in their ability to cut prices across the board.

Despite these difficulties in conflict with large manufacturers, Grangers did manage some success in working with particular manufacturers that allowed their agencies to thrive, if only for a short time. Local Granges had some success in cooperating with smaller manufacturers. The *Prairie Farmer*'s coverage of the Illinois State Fair in 1873 noted that small, local manufacturers, like the Eagle Agricultural Works, “have been doing an extensive trade with Granges and Clubs, and invites correspondence with them.”⁶⁰⁴ Both local and state Granges often had the most success purchasing not only from small manufacturers, but small machines.⁶⁰⁵ The Grangers of Bourbon, Indiana, for instance, secured a fifty per cent discount on sewing machines

⁶⁰² *Minutes of North Star Grange*, 187.

⁶⁰³ Aiken, 12; Daniel Ott's account of the McCormick response to the Granges shows not only general undercutting, but also the use of targeted offers made to specific Grangers in order to undermine the solidity of their efforts. See, Daniel Ott, “Producing a Past: Cyrus McCormick's Reaper from Heritage to History” (Chicago, Loyola University, 2014); Daniel Ott, “Producing a Past: McCormick Harvester and Producer Populists in the 1890s,” *Agricultural History* 88, no. 1 (January 2014): 87–119.

⁶⁰⁴ “Illinois State Fair.” *Prairie Farmer*, September 27, 1873, 306; See also, “Farm Machinery.” *Grange Advance*, July 8, 1874, 7.

⁶⁰⁵ Buck, 265-270 observed this as well.

through their local operation.⁶⁰⁶ State agencies also had more success procuring small machines and implements than they did large harvesters or threshing machines. A “Hoosier Patron” reported to the *Prairie Farmer* that the Indiana state purchasing agent had been doing a good business and had furnished one hundred and thirty corn drills, sixty-six sewing machines, and eleven washing machines in May.⁶⁰⁷ In July, the agent had managed another twenty-eight washing machines and forty-seven sewing machines. In time for the harvest, he had also secured twenty-two reapers.⁶⁰⁸ The Illinois Grange found similar success with sewing machines, but not with reapers and mowers.⁶⁰⁹ Some of the Grangers’ success in dealing with these manufacturers was likely rooted in the differences between the sewing machine industry and that of the harvester industry. The “patent wars” of the 1850s weakened sewing machine patent claims, and Singer emerged as the hegemon of the industry.⁶¹⁰ Singer seems to have allowed local agents more leeway to lower prices themselves, and local agents may have thus been more able to compromise with the Grangers than field machine agents were.⁶¹¹

⁶⁰⁶ “Patron Items.” *Ohio Farmer*, vol. 45, no. 24, June 13, 1874, 375; See also, “LaSalle Co. Union Grange.” *Prairie Farmer*, June 26, 1875, 203.

⁶⁰⁷ Patrons of Husbandry. *Prairie Farmer*, May 22, 1875, 163.

⁶⁰⁸ Patrons of Husbandry. *Prairie Farmer*, July 3, 1875, 211; See also, “The Business Agency.” *Indiana Farmer*. February 13, 1875, 4. American Antiquarian Society Historical Periodicals Collection, Series 5. EBSCOhost.

⁶⁰⁹ *Proceedings of the Illinois State Grange at the Fifth Annual Session* (Springfield, IL: Patrons of Husbandry, Illinois Grange, 1876).

⁶¹⁰ For the sewing machine industry, see, Brandon, 67-99; Adam Mossoff, “The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s,” *Arizona Law Review* 53, no. 1 (Spring 2011): 165–211. For the legal battles and consolidations of harvester companies over patents to something like the Marsh elevated harvester design, see, Winder, 48-50.

⁶¹¹ Jack, “Channels of Distribution for an Innovation: The Sewing-Machine Industry in America, 1860-1865,” 130.

Some smaller manufacturers, on the other hand, would deal so extensively with state and local Granges that their machines could be identified as Granger machines. The makers of the Home Sewing Machine, for instance, endeared themselves to Grangers by selling through Grange agents, rather than through any company agents of their own, in Michigan and Indiana, and continued to be the sewing machine most closely connected to what remained of multiple state agencies in ensuing years.⁶¹² Manufacturers of the Home machine issued confidential circulars to local Grange agents in Indiana.⁶¹³ Grangers in Michigan lauded another firm as the makers of a Grange machine. The Michigan Grange reported that a company which manufactured the Whitney sewing machine was resolved to hire no agents of its own and instead deal closely with the Grange.⁶¹⁴ The state agent of the Wisconsin Grange stated in his report for 1876 that “the Granges throughout the different states are generally ituned [sic] on one sewing machine. This enables the company to sell their entire manufacturer without a single local agent, and gives a first-class machines at half the price.”⁶¹⁵ Earlier that year, the Ohio Grange’s business agency referred to its business with the makers of the Jackson and Whitney sewing machine: “we

⁶¹² “Strictly Confidential: Office of the Home Sewing Machine” (Johnson, Clark and Co., April 1874), L354, Box 3, Folder 8, Isaac W. Beeson Papers, Indiana State Library; “State Agent’s Department.” *Grange Visitor*. April 1877, Vol. 3, No. 1, p. 6; “State Agent’s Department.” *Grange Visitor*. August 15, 1878, Vol. 3, No. 6, p. 4; The Michigan state agency began to move away from the Home company in late 1878 as that company began to hire agents of its own. See, “State Agent’s Department.” *Grange Visitor*. November 1, 1878, vol. 4, no. 21, 3.

⁶¹³ Johnson Clark and Co., “Strictly Confidential: Office of the Home Sewing Machine,” April 1874, L354, Box 3, Folder 8, Isaac W. Beeson Papers, Indiana State Library.

⁶¹⁴ “The Whitney Sewing Machine.” *Circular of the Executive Committee of the Michigan State Grange*. May 1875, vol 1., no 2., p. 6. Michigan State University Libraries, Digital Repository. <https://d.lib.msu.edu/grange>.

⁶¹⁵ *Proceedings of the Fourth Annual Meeting of the Wisconsin State Grange, Patrons of Husbandry* (Milwaukee: Sentinel Company, 1876), 43.

are satisfied that we did a good thing for our members in securing the exclusive management and sale of this excellent machine in this state.”⁶¹⁶ The relationship established with these sewing machine companies was among the closest the Granges came to their goal of replacing the manufacturers’ agency system with their own.

Grangers also identified some harvesters as Grange machines. One of those was the Climax reaper and mower, manufactured in Chicago. The makers of the Climax first dealt with the Illinois state Grange in 1874.⁶¹⁷ In subsequent years, Grangers promoted the machine in other Midwestern states as one of their own.⁶¹⁸ The Climax thus became more than a regional machine, and Grangers associated with their broader movement. While the Climax was a reaper quite similar to those that had dominated the harvest of wheat since the middle of the century, other Grange machines would emerge in the context of the success of the Marsh harvester in the 1870s.

The Marsh harvester was at the forefront of the industry in the mid-1870s. In 1873, John Edgar, a local McCormick agent in Minnesota, wrote, “The Marsh harvester has been the rage all through the territory this season. The feeling has been strongly in favor.”⁶¹⁹ McCormick agents had to worry about this competition from a new line of

⁶¹⁶ H. H. Hill. “Patrons of Husbandry: Ohio Business Agency.” *Ohio Farmer*, vol. 49, no. 2, January 15, 1876, 23.

⁶¹⁷ “A Meeting of Purchasing Agents.” *Prairie Farmer*, November 28, 1874, 379.

⁶¹⁸ *Proceedings of the Third Annual Session of the Michigan State Grange of Patrons of Husbandry* (Kalamazoo: Kalamazoo Publishing Company, 1876), 33; “Ohio Business Agency.” *Ohio Farmer*, vol. 49, no. 15, April 15, 1876, 231; “The Patron’s Machine.” *Circular of the Executive Committee of the Michigan State Grange*, April 1875, vol. 1, no. 1, p. 8.

⁶¹⁹ John Edgar to Cyrus Hall McCormick, August 16, 1873, McCormick Mss 1A, Box 48, C.H.M. Correspondence; See also, John Edgar to Cyrus Hall McCormick, June 16, 1874, McCormick Mss 1A, Box 53, C.H.M. Correspondence.

harvesters. Grangers, on the other hand, also had reason to worry about the success of the Marsh harvester—particularly because of the Marsh brothers’ steadfast opposition to the Grange and refusal to work with Grange agencies in any capacity.⁶²⁰

Yet the Grange came to control the patents for a machine called the “Werner harvester” that was similar in form and operation to the Marsh harvester. The Iowa state agent discovered the Werner harvester and began working with its manufacturers in 1873 with aims to sell this machine, in lieu of those made by hostile manufactures, to Grangers. About two hundred and fifty Werner harvesters were furnished to Grangers in Iowa and surrounding states for the harvest of 1874.⁶²¹ Grange-friendly newspapers wrote favorably of the machine.⁶²² Yet there was also apparently some doubt about the quality of the machine. Grangers defended its reputation, asserting that, of the hundreds of machines furnished for 1874, only eleven had reported defects and these had been handled somehow by Grange agents.⁶²³

The Werner was enough of a success in 1874 to cause concern among McCormick agents. John Edgar reported of the Werner harvester in Minnesota that “they will sell all they can get here” and noted that they machine was “nearly the same as the Marsh.”⁶²⁴ Charles Colahan, another employee of the McCormick company,

⁶²⁰ J. S. Denman. “Purchasing Tools-A State Agent Speaks.” *Prairie Farmer*, November 8, 1873, 355; Cerny, 193.

⁶²¹ Buck, 268-269.

⁶²² “The Werner Harvester.” *Prairie Farmer*, May 2, 1874, 139; “The Patrons.” *Prairie Farmer*, October 3, 1874, 314; E. E. Dickerson. Correspondence. May 13, 1874, 5.

⁶²³ “The Werner Harvester.” *Prairie Farmer*, October 31, 1874, 347; J. S. Denman. “State Agency of Minneapolis.” *Farmers’ Union*, May 16, 1874, 148.

⁶²⁴ John Edgar to Cyrus Hall McCormick, July 13, 1874, McCormick Mss 1A, Box 53, C.H.M. Correspondence.

recommended that McCormick attempt to “anticipate” the Werner patent in a legal maneuver to undermine it.⁶²⁵ McCormick considered this strategy in the company’s struggle with the Grange. The ability of the Grange to cooperate with the manufacturers of a competing machine threatened the leading firms of the industry and sent them looking for legal strategies to ameliorate the threat.

In the end, patent challenges did doom the Werner harvester, but these challenges came from the Marshes rather than from McCormick. The Marsh brothers threatened a lawsuit which caused many Grangers to back off from the machine in following years.⁶²⁶ In fact, Grangers seem to have been aware of the patent problems the machine may face in 1874, as the Michigan state Grange decided not to order samples of the Werner harvester for fear of a patent lawsuit.⁶²⁷ Patent law worked against the Grangers in this instance, just as the Grangers believed it often worked against farmers generally. The National Grange used a good portion of its funds in attempts to purchase a number of patents in the hopes of protecting the efforts of the Grange contest for control of the most important machines of the era, but with little success.⁶²⁸ In addition to securing deals with manufacturers of machines like the Climax and Werner harvesters, a few Granges even attempted to manufacture machines for themselves, but all efforts were hampered by a

⁶²⁵ Charles Colahan to Cyrus Hall McCormick, October 29, 1875, McCormick Mss 1A, Box 57, C.H.M. Correspondence.

⁶²⁶ Buck, 268-269.

⁶²⁷ *Proceedings of the First Annual Session of the Michigan State Grange, Patrons of Husbandry* (Michigan State Grange, Patrons of Husbandry, 1874), 12, 16.

⁶²⁸ Buck, 269.

lack of manufacturing knowledge, experience, and capital.⁶²⁹ Although Grangers sought to assert their rights as the producers of mechanized agriculture, their successes in claiming agency over mechanized agriculture was limited by their legal and practical inability to act as sellers of farm machinery.

Granger cooperatives were forerunners to other purchasing systems that would reshape how farmers embraced and imagined the world of consumption. The Grangers' efforts to connect consumers directly to manufacturers and dispense with middlemen influenced the development of mail-order systems, particularly the system developed by Montgomery Ward. These systems drew farming people more thoroughly into consumerism not only as a social action, but as a culturally and politically valorized one as well. The efforts of Grangers to reshape rural consumption, framed as they were around farmers' producerist identities, nonetheless contributed to the development of rural consumerism.⁶³⁰

The Granger movement engaged in economic conflict with the manufacturers of farm machines and their agents over who would control and profit most from the mechanization of agriculture. The central conflict that defined the farmer agitation and company reaction of the 1870s was Granger efforts to construct new systems of machine

⁶²⁹ Buck, 269-270; Cerny, 196-203; Amos Warner, "Three Phases of Cooperation in the West," in *Publications of the American Economic Association*, vol. 2, 1888; See also, "Scott County, Iowa." *Prairie Farmer*, January 10, 1874, 11; "Menard (Ill) County Council." *Prairie Farmer*, April 4, 1874, 107; "Patrons of Husbandry." *Prairie Farmer*, May 29, 1875, 171; See also, "Grange Items." *Grange Visitor*, June 1875, vol. 1, no. 1, p. 7; "Missouri Patrons Manufacturing Company." *Prairie Farmer*, November 21, 1874, 371; T. N. Bobbitt, "My Recollections of the Early Grange in Nebraska," *Nebraska History* 5, no. 1 (January 1922): 13-14.

⁶³⁰ Blanke, 184-215.

purchase and distribution and the resistance of manufacturers and their agents to those systems. Grangers faced many difficulties in this fight from manufacturers and their agents. But they also struggled with internal conflict within the Grange as members questioned the extent to which it was proper for farmers to engage in building institutions that themselves became enmeshed in the economy of circulation and large-scale business.

Conflict Within the Granger Movement

There were conflicts within the Granger movement concerning the extent to which the Grange ought to act in the world of business as it sought to build alternative systems of machine purchase and distribution. Some Grangers embraced the need for Grange agencies to grow and assert the force of their size in the market, while others saw such growth as monopolism. Additionally, farmers' producerist mistrust of commerce in general hung over Grange efforts and undermined the legitimacy and support for Granger cooperative efforts, especially those conducted on a large scale. Many historians have pointed to the Grangers' inexperience in business and lack of capital as reasons for the abrupt setbacks that Grange cooperative efforts faced in the second half of the 1870s.⁶³¹

Thomas Wood and David Blanke, on the other hand, attribute some of the Grangers

⁶³¹ Arthur Hirsch, "Efforts of the Grange in the Middle West to Control the Price of Farm Machinery"; Buck, 274-275; Cerny, 204; Nordin, 151-167; Margaret K. Andersen, "Agrarian Union: The Grange in the Midwest, 1870-1900" (Evanston, Northwestern University, 1989), 153-169; Colston Estley Warne, *The Consumer's Co-Operative Movement in Illinois* (Chicago: University of Chicago Press, 1926); Hurt, "The Ohio Grange."

struggles in the second half of the 1870s to ideological conflicts among leaders of the Grange. Blanke, particularly, sees a struggle between those Grangers who favored the building of cooperative stores on the Rochdale plan borrowed from English cooperatives and those Grangers who favored staying the course with state purchasing agencies.⁶³² These conflicts about how farming people ought to engage in the economy of circulation, and a resulting unwillingness to act within that economy, hampered the ability of Grangers to assert control over the purchase and distribution of productive machinery.

Producerist Grangers struggled over the question of where their appointed agents fit into a world of non-producing middlemen from their earliest efforts. One farmer who was critical of Grange efforts, asked the *Farmer's Advocate*, "if agents and middlemen are such villains now, how can we be sure of their honesty when employed by the Grangers?"⁶³³ This critic pointed out that Grange agents were themselves enmeshed in the same economy of circulation that farmers distrusted. A response from a Granger in the next issue simply reiterated the point that the Grangers were seeking to do away with middlemen, rather than replace them, but did not explain how Grange agents fit into that plan.⁶³⁴ Minnesota state agent, J. H. Denman, received similar criticism from farmers, and even from Grangers themselves in Grange-friendly newspapers.⁶³⁵ Other Minnesota

⁶³² Wood, 147-164; Blanke, 161-183, sees the state purchasing agencies as the strategy of rural consumerism while the various schemes for Rochdale stores were influenced by the ideology of national leadership that was invested in keeping itself pure of pecuniary schemes; Buck, 260-264, argues, on the contrary, that the Rochdale stores were more sustainable than the state purchasing agencies and that the Order was already in decline by the time the establishment of local cooperative stores became the preferred strategy of the National Grange as well as many locals.

⁶³³ Thomas Dunington. "Agents Grangers, etc." *Farmer's Advocate*, vol. 10, no.2, February 1875, 27.

⁶³⁴ W. N. Harris. Patrons of Husbandry. *Farmer's Advocate*, vol. 10, no. 3, March 1875, 35.

⁶³⁵ Cerny, 192; E. N. West. Correspondence. *Grange Advance*, March 11, 1874, 2.

Grangers, and even local Grange agents, wrote to their papers to defend Denman and to assert that he was nothing like company agents because his job was to work on behalf of farmers.⁶³⁶ These conflicts illustrate the distrust farmers held for businessmen, even those who professed to act in their interest and for their organizations.

Grangers also avoided risk and the use of credit, when possible, out of a skepticism of the economy of circulation. They often pointed to credit purchasing as a problem of its own.⁶³⁷ A contributor to the *Prairie Farmer* penned an article titled, “The Farmer’s Promises to Pay,” that blamed long-term credit arrangements on the purchase of machines for many problems. He described these arrangements as “favorable to the heavy capitalist” as well as to their “army of middle-men.” Grangers thus expressed their discomfort both with the power amassed by large manufacturers like McCormick as well as with the emerging economy of circulation and capitalist risk.⁶³⁸ In the early years of Granger cooperative efforts, a preference for cash payments was often the first thing that manufacturers and Grangers could agree upon when meeting together.⁶³⁹ When John Edgar recommended that McCormick offer a larger discount to farmers willing to pay in cash, he added, “in my talk with the Grangers I always tell them hope is not in combination but in cash. When they can come into the market cash in hand they can hope

⁶³⁶ E.N. West. “Correspondence.” *Grange Advance*, March 11, 1874, 2.

⁶³⁷ “Illinois State Grange.” *Prairie Farmer*, January 23, 1875, 27.

⁶³⁸ “Farmers’ Promises to Pay.” *Prairie Farmer*, June 8, 1872, 178.

⁶³⁹ “The Farmers and Middle Men.” *Prairie Farmer*, January 25, 1873, 25; “To the Farmers of Hancock and Adjoining Counties.” *Prairie Farmer*, February 15, 1873, 52.

to bring down prices but not otherwise.”⁶⁴⁰ Other companies responded similarly, by offering discounts for cash.⁶⁴¹ Both parties preferred to avoid the risk of credit relationships, but Grangers particularly sought to avoid participating further in the economy of circulation.

Though Grangers sought to use cash, farmers were often cash poor in the wake of the Panic of 1873. The impetus to avoid credit limited Grange efforts. Machine company agents took note of this fact. McCormick agent, John Shaffer, noted of local Grangers that “they do pretend to be able to pay cash and if they so pretend we know they can not do it.”⁶⁴² Nevertheless, state Grange agents saw cash as a necessary part of any kind of cooperative buying operation. Wisconsin state agent, J. H. Osborn, claimed that unity of action was only possible when the state agent had the authority and ability to deal in cash.⁶⁴³ Local agencies often did the same. The Fierce county Grange in Wisconsin, for instance, claimed that they negotiated with manufacturers solely on the promise that individual members would pay cash.⁶⁴⁴ In 1876, the National Grange published a plan of recommendations for cooperatives of all levels which strongly advised to “never depart from the principle of buying and selling for cash.”⁶⁴⁵ Grangers also trumpeted the

⁶⁴⁰ John Edgar to Cyrus Hall McCormick, June 10, 1873, McCormick Mss 1A, Box 48, C.H.M. Correspondence.

⁶⁴¹ “Hand in your Orders for Marsh Harvesters, Early.” *Grange Advance*, June 10, 1874, 7.

⁶⁴² John R. Shaffer to Cyrus Hall McCormick, January 13, 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

⁶⁴³ “Meeting of Wisconsin State Grange.” *Prairie Farmer*, January 31, 1874, 34.

⁶⁴⁴ “In Fierce County, Wisconsin.” *Prairie Farmer*, July 18, 1874, 227.

⁶⁴⁵ “Co-operation.” *Prairie Farmer*, January 1, 1876, 3. For other instances of Grangers valorizing cash payment and arguing against debt purchasing, see, “Pay Your Debts.” *Farmers’ Union*, July 4, 1874, 204.

importance of paying in cash in local papers.⁶⁴⁶ Grange agencies saw cash as preferable to having their agencies mired in credit relationships.

The insistence on cash had to do with the fact that Grange agents did not have access to the same sources of credit that other large business operations did, in addition to the distrust of the economy of circulation. Yet whether the avoidance of credit was out of distrust or necessity, Grange agencies were limited by their practical inability to operate without it. When state agencies did deal in credit, they also had difficulties in collecting and the agency might take on debt itself to meet expenses.⁶⁴⁷ Local Grange stores had more leeway than state Grange agents when it came to offering machines on credit, but another retrospective article lamented that “bad debts” were a cause of the failure of some local cooperative stores in the second half of the 1870s.⁶⁴⁸ Individual agents were reluctant to personally take on the capitalist risks associated with credit for Grange agencies. Osborn reported about the 1875 season that he could only buy machines for members on credit through the Grange agency if he took on the risk personally.⁶⁴⁹ Unsurprisingly, few Grange agents chose to do so. A report of the state agent of Wisconsin noted that it was policy to “not enter into any transaction coupled with any risk.”⁶⁵⁰ Such caution certainly hindered Grange efforts to fulfill the demands of their

⁶⁴⁶ “Pay As You Go.” *Grange Visitor*, January 1876, vol. 1, no. 10, p. 6.

⁶⁴⁷ Douglass, “The Ohio Grange,” 25; See also, “Minutes of the Indiana State Grange” (1874-1880), L290, Box 2, Folder 2, Indiana State Grange Collection, Indiana State Library, p. 89-90.

⁶⁴⁸ “Grange Stores.” *Prairie Farmer*, August 9, 1879, 251.

⁶⁴⁹ *Proceedings of the Fourth Annual Meeting of the Wisconsin State Grange, Patrons of Husbandry* (Milwaukee: Sentinel Company, 1876), 44.

⁶⁵⁰ *Proceedings of the Fifth Annual Meeting of the Wisconsin State Grange, Patrons of Husbandry* (Milwaukee: Sentinel Company, 1877), 15-19.

members, take up any space in the market, and assert the claims of farmers as the producers and maintainers of mechanized farming. Some Grangers nevertheless continued to assert cash payments as the only worthwhile strategy. In the years after Grange membership had peaked and its efforts were far less ambitious, some Grangers would claim that the Grange had taught them the virtues of paying in cash.⁶⁵¹ Nevertheless, the Grangers' inability to replace the credit system on which many farmers purchased machines was a serious impediment to their efforts.

Producerist distrust of business and credit was accompanied by antimonopolism and hostility to large-scale organization. Antimonopolist farmers, who identified the combinations of railroads, manufacturers, and other capitalists as their enemy, were also somewhat wary of farmers' combinations. In 1872, Grangers in Illinois debated this issue in relation to two different "rings" of implement manufacturers. Both rings brought a number of manufacturers together in an effort to beat the other ring, and some Grangers saw both as monopolies. Other Grangers argued for siding with one ring against the other, in order to make the best of their own amalgamated buying power.⁶⁵² Concerns about monopoly also likely kept some farmers away from the Grange entirely. One farmer wrote to *Colman's Rural World* and compared the Grange to the monopolies it opposed. It also contrasted the Grange with trade unions and argued farmers had less to gain by unity of action than hired laborers did. He concluded that it would likely be other

⁶⁵¹ Aiken, 11; "What the Grange Has Done." *Prairie Farmer*, October 5, 1878, 315; Buck, 275, makes a similar claim and gives the Grangers credit for helping to reduce the reliance of the industry on credit arrangements.

⁶⁵² "They Refuse to Patronize." *Prairie Farmer*, April 6, 1872, 160.

classes of men than farmers who benefited from the schemes of the Grange.⁶⁵³ Another wrote to the *Farmers' Union* with similar concerns about the corruptibility of a centralized business system that professed to act on behalf of farmers, but would be administered, in part, by men of business.⁶⁵⁴ These skeptical farmers thus joined the antimonopolist critique of the Grange with a producerist one.

Some Grangers were more comfortable with the idea of the Grange as a large, organized, and countervailing economic power. When the *Prairie Farmer* first began reporting on the Grange, it accompanied the Grange constitution with assertions that the present was characterized by “the tendency in every department of labor or business to associate effort. Organization is the watchword of every enterprise.” The commentary argued that farmers must organize to stand against the power of merchants, manufacturers, and railroads who themselves were thoroughly organized.⁶⁵⁵ A Contributor to the *Ohio Farmer* also considered the question, “shall we organize?” He concluded that to not do so would allow farmers to remain “drudges and slaves.” The advance of economic combination and cooperation was a strong structural development of political, cultural, and economic life in the decades after the Civil War, and debates

⁶⁵³ “Cooperation.” *Colman's Rural World*, July 16, 1870, 121.

⁶⁵⁴ “The State Agency Business.” *Farmers' Union*, October 25, 1873, 341. For further discussion of this issue in the *Farmers' Union*, including a response from the state purchasing agent of Minnesota, see, J. S. Denman. “State Agency Again.” *Farmers' Union*, November 1, 1873, 343; E. A. Rich. “The ‘Fifth Wheel’ in the Grange.” *Farmers' Union*, November 22, 1873, 373.

⁶⁵⁵ “Re-Organization of the Illinois State Grange.” *Prairie Farmer*, March 16, 1872, 31.

among farmers and within the Grange about it demonstrate how farmers confronted their place in capitalism through Granger cooperative efforts.⁶⁵⁶

State purchasing agents were important figures in ideological debates amongst farmers and Grangers about questions of organization and monopoly. In 1873, a state purchasing agent proposed that Grange agents should seek out the best deals on machines for their members. He also believed these deals might come from buying in bulk from leading manufacturers. E. R. Smalley wrote against this strategy on the basis that it would simply abet the growth of monopolies.⁶⁵⁷ Another farmer, from Mercer, Illinois, wrote, apparently in agreement with the purchasing agent, that Granges should deal with “at most two manufacturers” of any given article in order to consolidate and aggregate their buying power.⁶⁵⁸ State agents often called for “unity of action” and advocated the economic strength and advantage that operating as a large entity could grant to farmers.⁶⁵⁹ The supporters of this plan were more interested in building an alternative to manufacturers’ systems of machine purchase and distribution, while others saw such alternatives as monopolies themselves. This conflict pitted state purchasing agents and their supporters against those critical of large Grange agencies.

⁶⁵⁶ Richard White, *The Republic For Which It Stands: The United States During Reconstruction and the Gilded Age, 1865-1896* (New York: Oxford University Press, 2017), identifies cooperation as a central theme of the era.

⁶⁵⁷ E.R. Smalley. “The Business Feature of It.” *Prairie Farmer*, December 6, 1873, 387; On the Ohio Agency, see also Hurt, “The Ohio Grange.”

⁶⁵⁸ “A Suggestion.” *Prairie Farmer*, March 27, 1875, 99.

⁶⁵⁹ “Meeting of Wisconsin State Grange.” *Prairie Farmer*, January 31, 1874, 35; “Some Hints on Business Matters.” *Prairie Farmer*, May 9, 1874, 147; *First Annual Proceedings of the Michigan State Grange* (Published by Michigan State Grange, Patrons of Husbandry, 1874), 11-12.

Due in part to these divisions as well as to the logistical difficulties of coordination between Granges, a true unity of action failed to materialize in the 1870s. In 1876, a report in the *Proceedings* of the Illinois state Grange expressed the hope that “when a uniform business system shall be adopted by the over 25,000 subordinate granges, the order of the patrons of husbandry will become a unit as it were, and will move irresistibly forward.”⁶⁶⁰ That vision never came any closer to fruition than it had been in 1874 and 1875. By the middle of the decade, the antimonopolist skepticism of state Grange agencies inaugurated their decline.

Local cooperative stores became the predominant feature of Grange and club efforts in the years after 1875 and Grange membership and leadership turned away from the state agencies. State Granges began to abandon their state agency plans in favor of smaller-scale and localized cooperative stores. They did so, in part, out of antimonopolist concerns about the growth of both state Granges and the National Grange, as well as out of increased enthusiasm among Grange leaders for the Rochdale system of cooperative stores. The Rochdale plan that Grangers sought to emulate placed more importance on the local self-determination of each cooperative store than state organizations, and while Grangers encouraged cooperation between stores, their localism nonetheless diffused negotiating power alongside decision-making power. Against both this abandonment of the state purchasing agency system and the continued challenges of operating on behalf

⁶⁶⁰ *Proceedings of the Illinois State Grange at the Fifth Annual Session* (Springfield, IL: Patrons of Husbandry, Illinois Grange, 1876), 94-96.

of farmers in the realm of business, the cooperative phase of the Granger movement rapidly faded.

Attitudes within local Granges towards ambitious, large-scale organizations doomed state purchasing agencies. Some local Granges began to pass resolutions of disapproval against the leadership of the National Grange for its spending, for accumulating a large fund, and for refusing to reduce membership fees. A resolution of disapproval from an Illinois local Grange stated, “that we disapprove the action of the National Grange in refusing to lower in amount the fees and dues, as a large fund is accumulating in the treasury of the National Grange, and for what object we are not permitted to know.” Another resolution followed the first and condemned the National Grange for its stance in favor of Federal funding for the Texas Pacific Railroad, seemingly connecting both concerns to antimonopolist impulses.⁶⁶¹ These resolutions of disapproval were sometimes also accompanied by discourse on the reform of the Grange’s ritual practices, though the growing size and treasuries of the state and National Granges remained a central point of contention as some local Granges demanded that the larger organizations redistribute funds back to more local Granges.⁶⁶² These demands eventually led to a distribution of the funds of the National Grange’s treasury back to

⁶⁶¹ “Resolutions of Disapproval.” *Prairie Farmer*, June 5, 1875, 179. For earlier examples of local Grangers expressing concerns about overreach from the National Grange, see, “The National Grange as a Purchasing Agent.” *Farmers’ Union*, August 1, 1874, 237; “Reduction of Fees.” *Indiana Farmer*, October 9, 1875, 4; “And Now They Are Troubled.” *Indiana Farmer*, February 13, 1875, 4.

⁶⁶² “Winnebago County Grange No 73, Minutes” (February 18, 1874), MS-BC508, Box 1, Abraham Lincoln Presidential Library and Museum, p. 45-47.

state and local granges and a withdrawal of the National Grange from large plans such as a possible connection to English manufacturing cooperatives.⁶⁶³

Local skepticism of large agencies continued to shape the activities of state Granges after 1875. Local Granges in Indiana passed resolutions against the Indiana Grange for amassing too great of a treasury and asked that the funds be distributed to local Granges.⁶⁶⁴ In some cases, it appears that local Granges did receive some dispersed funds back from the state Grange in 1877 or 1878.⁶⁶⁵ This is a stark difference from the time not many years before when local Granges had elected voluntarily to contribute more funds to the state Grange for the purpose of building up the infrastructure of the state purchasing agency. The construction of a system of machine maintenance and distribution that could have replaced the company agency system would likely have taken more funds than state Granges could manage.⁶⁶⁶ Skepticism of the centralization of authority in both National and state Granges limited their organizational capacities.⁶⁶⁷ Though some local Granges had established cooperative stores earlier, it was in this context that some began looking to cooperative stores as the central strategy for the whole Granger movement.⁶⁶⁸

⁶⁶³ This dispersal of funds left the state and national Granges with little to work with, but often did not provide a large enough sum for local Grangers to make use of either. See, Aiken, 11; Buck, 270-275.

⁶⁶⁴ "Paxton Grange No. 1048." *Indiana Farmer*, August 5, 1876, p. 5.

⁶⁶⁵ "Invoice, Patrons of Husbandry, Nettle Creek Grange No. 735," n.d., L354, Box 4, Folder 5, Isaac W. Beeson Papers, Indiana State Library.

⁶⁶⁶ "The Grange-How Best to Conduct It." *Prairie Farmer*, January 30, 1875, 35.

⁶⁶⁷ Blanke, 128-129.

⁶⁶⁸ "Menard (Ill) County Council. *Prairie Farmer*, April 4, 1874, 107; "A Farmers' Implement Store." *Prairie Farmer*, March 22, 1873, 91.

The impetus to move towards the strategy of Rochdale stores germinated in the state and national Granges as well. The Committee on Cooperation of the Michigan state Grange recommended doing away with state purchasing agents in favor of cooperative stores in 1875, and the Finance Committee followed with a cut to the state agent's budget and a reduction of the scope of his duties and authority.⁶⁶⁹ Illinois followed a similar trajectory when state agent Frew met with local purchasing agents in September of 1875 to discuss the possibilities of joint stock cooperative stores with more local direction. The Illinois Grange's Committee on Cooperation sought to establish Rochdale stores as well. The committee recommended that the stores take over the roles of the state agency in negotiating prices and issuing private price circulars.⁶⁷⁰ Such plans were pursued in other states as well, including when the Pleasant Grange in Ohio reported their establishment of a joint-stock cooperative store the next year.⁶⁷¹ Granger interest in the Rochdale system had begun even amidst the enthusiasm for state agencies in 1874.⁶⁷² The interest in cooperative stores was then related to the efforts of the National Grange to establish a connection to England whereby American Grangers' grain might be sold to English manufacturing worker cooperatives that followed the system. Despite efforts and steps taken on the other side of the Atlantic to make this happen, Aiken reported that it was

⁶⁶⁹ *Proceedings of the Second Annual Session of the Michigan State Grange of Patrons of Husbandry* (Michigan State Grange, 1875), 33.

⁶⁷⁰ *Proceedings of the Illinois State Grange at the Fifth Annual Session* (Springfield, IL: Patrons of Husbandry, Illinois Grange, 1876), 74.

⁶⁷¹ "A Live Grange." *Ohio Farmer*, vol. 49, no. 14, April 8, 1876, 215; See also, "Grange Enterprise and Pluck." *Indiana Farmer*, August 5, 1876, 5.

⁶⁷² "Meeting of Wisconsin State Grange." *Prairie Farmer*, January 31, 1874, 35; "The Rochdale Co-operative Store." *Prairie Farmer*, August 22, 1874, 267; "Co-operative Stores." *Prairie Farmer*, October 17, 1874, 331.

made impossible by the fact that by the end of 1875 “the executive committee were not competent to control the purchases or sales for a single subordinate Grange.”⁶⁷³ The inability of the National Grange to negotiate for any local Granges was ironically connected to the same antimonopolist suspicions of large-scale economic entities that pushed local stores to the forefront of Grange efforts.

The move away from state agencies brought with it a general reduction in Granger cooperative business as well as in the organization’s growth over the second half of the decade. Nevertheless, some local cooperative stores continued in operation for years, and even the state agency of Ohio continued doing thousands of dollars’ worth of business until it ceased operations in 1879.⁶⁷⁴ Even there, however, the concern about the Grange’s waning “energy” was apparent in the middle years of the 1870s.⁶⁷⁵ It was apparent to most observers in the second half of the 1870s, including most Grangers, that the farmers had lost their war against the middlemen and monopolies. Some of the difficulties they faced in that conflict were internal conflicts about the extent to which the Grange itself should participate in the capitalist economy of middlemen and monopolies.

The Grangers’ efforts to replace the middlemen and monopolists with a purchasing structure of their own making stalled as it confronted the difficulties of

⁶⁷³ Aiken, 14. For more on the growing preeminence of Grange stores on the Rochdale plan as well as the attempted connection to England, see Nordin, 147-149 and Buck, 263-264.

⁶⁷⁴ “Ohio Business Agency.” *Ohio Farmer*, vol. 52, no. 7, August 18, 1877, 103; “Ohio Business Agency.” *Ohio Farmer*, vol. 52, no. 7, October 20, 1877, 103; “The Ohio State Grange.” *Ohio Farmer*, vol. 56, no. 25, December 20, 1879, 392. For more on the Ohio agency, see, Hurt, “The Ohio Grange.”

⁶⁷⁵ Isaac Kagg. “Objects and Mission of the Order-Conduct and Ultimate Success.” *Ohio Farmer*, vol. 49, no. 14, April 8, 1876, 215.

business as well as the skepticism of some of its members. Nevertheless, some Granger cooperative activity survived into later decades and would influence revitalized efforts in the late 1880s and early 1890s. The Grangers' cooperative schemes of the mid-1870s had made systems of machine purchase and distribution into a terrain of struggle. In those struggles, they also encountered problems of machine knowledge and maintenance.

Contesting Machine Knowledge and Purchasing

As Grangers attempted to build their own systems of machine purchase and distribution, they struggled with problems of machine knowledge. In order to make worthwhile purchases, Grange agents had to get good machines that would work for individual farm families who were often skeptical of the Grange agencies themselves. The producerist and antimonopolist refusal to perform the work of "middlemen" themselves, as well as the limited capacity of Granges to institutionally act as centers of machine knowledge and distribution, prevented them from replacing manufacturers and their agents as places of power within the farm machine industry. Granger criticisms of the ability of individual farmers to act as responsible purchasers of machines revealed anxieties about the difficulties of purchasing good machinery, but it was the inability of Grange agencies themselves to incorporate machine knowledge into their systems of purchase and distribution that hindered their efforts.

Knowledge of the various types and models of farm machines on the market was an essential feature of Grangers' endeavors to take command of agricultural technology and played a role in machine purchasing. Grangers both cultivated and attempted to assert their machine knowledge and expertise as farmers. In their effort to get the best machines for the lowest possible costs, knowledge of machine quality was something that the Grangers sought to achieve even where it was difficult. The choice of which machine to purchase took on added importance when that choice—as made by ordinary farmers or Grange agents—carried the weight not only of individual farmers but also of the success of Granger cooperative schemes. Farmers turned to the Grange as an institution through which to cultivate machine knowledge and relied on machine knowledge in order to run the Grange.

Farmers used their Granges as spaces in which to discuss machines and to cultivate machine knowledge. Some of these discussions revolved around the purpose of comparing machines on the market so that farmers might make better individual decisions when it came to buying machines. These discussions occurred in the pages of Granger newspapers as contributors and readers wrote in with information on how machines performed.⁶⁷⁶ Granger newspapers also reported on discussions that went on within local Grange meetings about machines. *Colman's Rural World* noted that members of recently organized Granges were sharing “information relative to machinery,

⁶⁷⁶ E. H. Bousten. *Grange Advance*, April 27, 1875, 4; “Correspondence.” *Grange Advance*, August 11, 1875, 1.

tools, seeds, etc., which they may have tested, either in favor of or otherwise.”⁶⁷⁷ A couple years later, in 1872, the *Prairie Farmer* argued that these discussions were helping farmers in their selection of machinery:

The extended comparison of views on the merits of different agricultural implements and different modes of farming has been especially valuable. Humbug machinery cannot secure much sale among Patrons, while valuable implements are thoroughly and widely advertised.⁶⁷⁸

A contributor to the *Ohio Farmer* who identified himself as a “husbandman” likewise extolled the Grange as a space to cultivate machine knowledge. He wrote:

We will not persist in believing that a certain implement is the only good one in [the] market simply because an interested agent has so informed us. We will examine the machine ourselves. We will look at their work, we will take the testimony of those who have used them and weigh it fairly.⁶⁷⁹

Meeting notes and minutes of local Granges also reveal these discussions, which often included the perspectives of individual farmers on which machines were of the highest quality or best adapted to their needs. One farmer expressed his preference for McCormick machines in a discussion, while another “spoke of a new machine which he had seen which cost 85 dollars. But did not seem to think it cheapest in the end.” Farmers shared such judgements on the quality of various machines in their local Grange meetings.⁶⁸⁰

⁶⁷⁷ Patrons. *Colman's Rural World*, September 3, 1870, 180.

⁶⁷⁸ “Patrons of Husbandry: How the Order Stands.” *Prairie Farmer*, May 18, 1872, 154.

⁶⁷⁹ “The Grange and Agricultural Progress.” *Ohio Farmer*, vol 47, no. 26, June 26, 1875, 407.

⁶⁸⁰ “‘Aug’ Notes on Discussion,” n.d., P2004, Box 1, Folder 2, Bloomington Grange No. 482, Minnesota Historical Society; “‘The Topic for Today Is Care of Farm Machinery’ Notes on Discussion,” n.d., P2004, Box 1, Folder 2, Bloomington Grange No. 482, Minnesota Historical Society. These conversations were accompanied by discussions of all types of farm concerns, both pertaining to the fields and the household. Women Grangers may have discussed sewing and washing machines within their Granges as well. See, for

Grangers expected their purchasing agents, in particular, to develop a useful familiarity with machines. These ordinary farmers had to cultivate machine knowledge in order to serve as the farmers' representatives in the world of machine purchasing. One state Grange agent attempted to help cultivate this knowledge among local agents by insisting that all local agents attend the state fair in order to see the machines of different makers and learn the state of the industry in many lines of machinery.⁶⁸¹ Occasionally Grange agents had assistance from their fellow Patrons in making decisions about which manufacturers to work with. A committee of five accompanied the purchasing agent of the Winnebago County Pomona Grange of Illinois "for the purpose of examining machinery."⁶⁸² Such a committee made the cultivation of essential machine knowledge a collective responsibility, if only briefly.

Grangers nonetheless struggled to apply their knowledge of farm machines to purchasing from manufacturers because they lacked the ability to ascertain machine quality on a large scale. While farmers had certainly developed intimate knowledge of their machines in the course of use and maintenance over previous decades, they often were unable to examine the machinery they would be purchasing through the Grange beforehand. Upon stepping down from his position, one Grange purchasing agent asserted that the desire of farmers to examine a machine before purchase made the

instance, "Discussions in the Grange." *Indiana Farmer*, February 13, 1875, 4; "To Lecturers!" *Circular of the Executive Committee of the Michigan State Grange*, April 1875, vol. 1, no 1, p. 7.

⁶⁸¹ "Michigan State Fair." *Grange Visitor*, August 1878, vol. 1, no. 5, p. 6.

⁶⁸² "Winnebago County Grange No 73, Minutes," 48.

Grange system of ordering machines through their own agents impossible.⁶⁸³ Yet the inability to examine machines for quality brought with it a new level of risk to purchasing through the Grange even if one used cash. Meanwhile, Grange agents and stores also had some difficulties sorting the high-quality machines from the low-quality machines. This was a particular problem as the leading firms in the industry were adamant about not giving the farmers any power or leverage and thus refused to work with the Grange altogether. Struggling with companies that made the McCormick reaper and the Marsh harvester meant competing for quality as well as for low prices. D. Sven Nordin argues that many of the companies that were most willing to deal with the Grangers were “fly-by-night” operations new to the industry that built lower quality machines than established firms.⁶⁸⁴ Some agents for the McCormick Company certainly would have agreed with that assessment. John Rhodes, of Dakota County Minnesota, for instance, reported that the Grangers had not succeeded in making deals for a single “first-class implement.”⁶⁸⁵ While the category of “first-class implement” was something of a matter of opinion, the fact that Grangers felt the need to strongly defend the Werner harvester from charges of material defects implies this may have been a concern with other machines.⁶⁸⁶

⁶⁸³ “Winnebago County Grange No 73, Minutes,” 56.

⁶⁸⁴ Nordin, 143-145.

⁶⁸⁵ John Rhodes to Cyrus Hall McCormick, July 20, 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

⁶⁸⁶ “Werner Harvester.” *Prairie Farmer*, October 31, 1874, 347.

Grangers took steps to address the issue of machine quality within their systems of machine selection and purchase. The manufacturers of the Climax line of mowers and reapers worked with the state Grange in Michigan to test their machines in order to ensure their quality would satisfy the farmers.⁶⁸⁷ Storerooms and supply houses allowed farmers to see multiple machines that their purchasing agents had either secured deals for the purchase of, or that were simply available through their Grange store. A local Grange in Xenia, Ohio, reported that it was renting rooms for a “Patron’s Exchange” in late 1874, but did not indicate if machines would be stored or shown there. Many storerooms put up by Granges and clubs seem to have been more for the storage of produce for sale than of machines to be purchased.⁶⁸⁸ Local Illinois Granges in Peoria, Yates City, and Bureau County, however, acquired sample rooms and demonstration places that would store and exhibit machines.⁶⁸⁹ D. H. Smith, a McCormick agent based in Wisconsin, reported that Grangers “are putting up their own buildings and warehouses in different parts of the state.”⁶⁹⁰ Some local Granges even used their meeting halls as display rooms.⁶⁹¹

The establishment of storerooms and supply houses was beyond the reach of many Granges, however, and the inability and unwillingness of Grangers to take on the

⁶⁸⁷ “Proceedings: Michigan State Grange in Annual Session.” *Grange Visitor*, December 1875, vol. 1, no. 9, p. 10.

⁶⁸⁸ Buck, 150.

⁶⁸⁹ “From Clay County.” *Prairie Farmer*, January 16, 1875, 21; “Notes from the Granges.” *Prairie Farmer*, April 10, 1875, 115; “Notes from the Granges.” *Prairie Farmer*, April 24, 1875, 131; See also, Scott, “Grangerism in Champaign County, Illinois, 1873-1877,” 154.

⁶⁹⁰ D. H. Smith to Cyrus Hall McCormick, November 10, 1874, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

⁶⁹¹ W. M. Geo. Mead. “South Camden.” *Grange Visitor*, August 1876, vol. 2, no. 5, p. 7; See also, “Grange Supply Houses.” *Grange Visitor*, September 1876, vol. 2, no. 6, p. 2.

roles of middlemen prevented them from building the organizational infrastructure necessary to maintain these spaces. The Grangers of Winnebago County, Illinois, for instance, approached the possibility of a cooperative store earlier and with more enthusiasm than many other Granges, but despite efforts to raise funds do not seem to have ever been able to rent a space for the store for any sustained period.⁶⁹² At one point, the Winnebago purchasing agent directed interested Grangers to meet him by a particular railroad bridge, so that they might observe and evaluate machinery together without the aid of a storeroom.⁶⁹³ Grangers had to resort to learning about the machines on the market in such alternative ways or instead return to the offices of merchants and machine company agents.

While most Grange storerooms and supply houses were connected to local cooperative stores, some Grangers had pursued the possibility of allowing space for the display and evaluation of machines as part of a statewide purchasing agency. The state agent of Illinois began making plans for a distributing depot from whence to send out machines in Chicago in September of 1875, though those plans were likely delayed by the shift away from statewide purchasing schemes.⁶⁹⁴ The state agent of Michigan reported on the availability of certain machines at his supply house in Battle Creek, but it is unclear if ordinary Grangers had the opportunity to see machines for themselves there.⁶⁹⁵ Either way, local stores would have been more accessible for this purpose than

⁶⁹² “Winnebago County Grange No 73, Minutes,” (February 18, 1874-March 2, 1882), p. 38-40, 45-47, 49.

⁶⁹³ “Winnebago County Grange No 73, Minutes,” p. 24.

⁶⁹⁴ “Meeting of the Purchasing Agents.” *Prairie Farmer*, September 25, 1875, 307.

⁶⁹⁵ “Purchasing Agents Supply House.” *Grange Visitor*, June 1875, vol. 1, no. 3, p. 6.

statewide agencies. Even if local stores were not present, the state agent of Indiana asked farmers who bought their machines early to serve as “samples” for their fellows so that other farmers might make informed decisions when they went to buy.⁶⁹⁶ The Grangers’ gradual abandonment of the project of the state agency systems, as well as the inability of those state agencies to maintain the infrastructure of machine knowledge prevented them from developing organizational machine knowledge for purposes of purchasing on a large scale.

As Grangers struggled to utilize machine knowledge for institutional machine purchase through the Grange, they expressed anxieties about the abilities of individual farmers to adequately use their knowledge and responsibly purchase machines. The symbolic importance of farm machine knowledge among individual farmers can be seen in the way that the *Grange Advance* asserted the farming *bonafides* of politician and national figure, Ignatius Donnelly:

The idea that he is a practical farmer has been ridiculed so much that many supposed he couldn’t tell a Berkshire pig from a J. I. Case and Co. threshing machine, or a Manny reaper from an American Eagle. This is a mistake. [...] Upon enquiring among his neighbors, we learn that he never speaks of the beautiful plumage of the Marsh Harvester, or the enchanting song of the Buck Eye Seeder.⁶⁹⁷

The *Grange Advance* connected Donnelly to the use and knowledge of farm machinery, albeit in comical fashion, and thus asserted his authenticity and expertise as a true farmer able to speak for farmers in a political context.

⁶⁹⁶ “The Business Agency.” *Indiana Farmer*, February 13, 1875, 4.

⁶⁹⁷ “Short Sketches of the Patrons in the Legislature.” *Grange Advance*, January 14, 1874, 1.

The farm press often expressed anxieties about the capacity of farmers to act responsibly in the purchase of machinery which betrayed a discomfort with the extent to which the purchase of machines brought farmers into economies of speculation and credit. The farm press had expressed concerns about how much machinery was appropriate for the average farmer in earlier years. Yet those discussions were about how much machinery would be useful for smaller farmers relative to the cost.⁶⁹⁸ By 1874, the farm press took a more moralistic tone to these discussions. An 1874 *Prairie Farmer* article titled, "Extravagance in Farm Machinery," for instance, lamented that "there is a too prevalent opinion that any man is justified in buying a reaper to cut twenty acres of grain, or that a common farmer, instead of making one combined reaper and mower do his work, may profitably own a harvester."⁶⁹⁹ Another *Prairie Farmer* article placed some of the blame for credit purchasing of machines on farmers as well. The writer also maintained that the quality of machines was actually made worse by the tendency towards buy on credit: "under this system, the farmer often does not buy the best implement or article which he wants, but that on which he can get the most time, and the longer the time, usually, the poorer the article."⁷⁰⁰ Over-extension into machine purchase through credit was thus held to harm not only the condition of the farmer's accounts, but of his machinery itself. As Grangers made claims to the status of farmers as the producers

⁶⁹⁸ See discussion in chapter 1; See also, "Farm Implements and Machinery." *Canadian Agriculturalist*, January 16, 1861, 41.

⁶⁹⁹ "Extravagance in Farm Machinery." *Prairie Farmer*, March 28, 1874, 97.

⁷⁰⁰ "Farmers' Promises to Pay." *Prairie Farmer*, June 8, 1872, 178.

of mechanized agriculture, the farm press implored individual farmers to act as responsible purchasers of machines.

Grangers themselves also expressed anxieties about the abilities of individual farmers to act as responsible machine purchasers. Granger and author of the *History of the Grange Movement* James Dabney McCabe blamed credit relationships and business agents for the farmer's plight, but he also reserved some blame for farmers themselves. McCabe also highlighted the risk of machine breakages, especially as farmers bought poorly constructed machines that dishonest agents and manufacturers pushed onto them. McCabe argued that this was the reality when farming people went to purchase any number of home or field machines.

McCabe's most salient example came in the form of the story of Farmer Green and his reaper. Farmer Green had just finished a good year and had finally paid off the mortgage on his land when a "smooth-tongued" agent convinced him to buy a new reaper. He got an "iron-clad note" for the debt he owed on the new machine, which, according to McCabe was "equivalent to a mortgage" in Iowa. Green was thus drawn right back into the world of capitalist risk because "in order to purchase the reaper, the farmer had imperiled his property, and had placed the safety of his home upon the turn of chance." Fortunately, the reaper worked perfectly. Unfortunately, Green was still unable to make the money necessary to pay back his debt. He had intended to hire the machine out to make extra money in the harvest season, but the same agent he bought his machine from had apparently also hired a machine out. That left few farmers looking to hire

Green's machine. The reaper thus "stood idle under its shed during the better portion of the harvest season." This and another unforeseen expense left Green unable to make his next payment. Green ended up having to take on another mortgage in order to pay back his debt and lost his farm, though McCabe does not report what became of him and his farm afterwards. While McCabe considered this ordeal to be "the logical consequence of a reckless and foolish act," he noted also that Green himself never blamed the reaper. Many of his fellow farmers likewise never blamed the machines themselves and would seek out ways to buy their machines with less risk through the Grange.⁷⁰¹ While McCabe wrote to criticize the agents and capitalists who got the farmer into this situation, it is clear that McCabe laid some blame on the "reckless" farmer. McCabe's characterization of Farmer Green's story revealed anxieties about farmers' increasing reliance on machines as well as about the shortcomings of their knowledge.

Criticisms of farmers' purchase of machinery came from their opponents as well, however, and Grangers defended their responsible use of machinery. Accusations of imprudence in conducting their affairs, including in purchasing farm machines, apparently were launched by railroad men in Minnesota to the point that the *Grange Advance* was compelled to address the question, "Are Farmers Improvident?" in 1873.⁷⁰² While Grangers like McCabe were clearly worried that farmers were making bad

⁷⁰¹ Martin (McCabe), *History of the Grange Movement*, 337-346; A very similar version of McCabe's story appeared in the *Grange Advance* alongside other articles critical of farmers' purchases of farm machines. "A Farm Ruined by a Reaper." *Grange Advance*, November 12, 1873, 6; "Extravagance in Agricultural Machinery." *Grange Advance*, November 12, 1873, 6.

⁷⁰² "Are Farmers Improvident." *Grange Advance*, October 15, 1873, 1.

decisions when it came to machinery, Grangers also continued to defend their use of machinery in general against the criticisms of railroad men or other capitalists. Even in the later years of the 1870s, after the efforts of the Grange had stalled, farmers continued to defend the purchase of machinery as either a boon or a necessity. In fact, Grangers often pointed to the increased access to machines that participation in the Grange had allowed them as a benefit of the organization.⁷⁰³ Grangers also pointed to the demands of the economy in the later 1870s, which saw falling grain prices, as demands that made the increased use of machines necessary.⁷⁰⁴ Many Grangers recognized that farmers needed to mechanize in order to stay afloat, whether they wanted to or not, and whether they could afford it or not.

The tendency of the farm press, and even some Grangers, to question farmers' practices of machine purchase was in part driven by the failure of the Grange to play a more significant role in the systems through which purchases were made. It was also a result of many farmers distrust of the activities of "middlemen" that were involved in machine purchase and distribution. The unwillingness and inability of the Grangers to take on the roles of the "middlemen" in the purchase and distribution of machines prevented them from playing a larger role in the purchase and distribution of machines. As Grangers built their alternative systems of machine purchase and distribution through purchasing agencies and cooperative stores, they built on the machine knowledge that

⁷⁰³ "Benefits of Attending the Grange—An Essay." *Grange Visitor*, December 1, 1879, vol 5, no. 23, p. 6.

⁷⁰⁴ "Do Unnecessary Expenditures Exceed Necessary Ones." *Grange Visitor*, September 15, 1879, vol. 4, no. 18, p. 2.

farming people had cultivated over the past decades. Yet their inability to turn machine knowledge into something the organization could use in the purchase of machinery hampered their abilities to replace company agents as distributors of machines.

Contesting Machine Maintenance

Grangers also expressed anxieties about machine maintenance—in part because they rested their claims to the fruits of industrial farming on their status as the producers of its technological systems, as well as because maintenance was also a practical consideration that Grange cooperative efforts had to contend with in their efforts to unseat manufacturers and their agents as the principal distributors of farm machines. While the farmers' lack of capital and manufacturing knowledge limited the Grangers' efforts to enter the machine industry as producers via manufacturing operations, they had more ability to act in the “middle-ground” between production and consumption as maintainers.⁷⁰⁵ Farmers had already established practices of machine maintenance on their own farms. Nevertheless, their efforts to address problems of machine maintenance within the Granges themselves were limited by the refusal of major firms in the industry

⁷⁰⁵ On the struggles of Granger operated manufacturing operations, see, Buck, 269-270; Cerny, 196-203; Amos Warner, “Three Phases of Cooperation in the West,” in *Publications of the American Economic Association*, vol. 2, 1888; See also, “Scott County, Iowa.” *Prairie Farmer*, January 10, 1874, 11; “Menard (Ill) County Council.” *Prairie Farmer*, April 4, 1874, 107; “Patrons of Husbandry.” *Prairie Farmer*, May 29, 1875, 171; See also, “Grange Items.” *Grange Visitor*, June 1875, vol. 1, no. 1, p. 7; “Missouri Patrons Manufacturing Company.” *Prairie Farmer*, November 21, 1874, 371; T. N. Bobbitt, “My Recollections of the Early Grange in Nebraska,” *Nebraska History* 5, no. 1 (January 1922): 13–14.

to deal with them, and also once again by the inability and unwillingness of Grangers to take roles performed by merchants and other “middlemen.” Without large distribution systems of their own, Grangers were unable to supply the repair parts and knowledge necessary to make their cooperatives successful. Their failures to address the maintenance issue also left manufacturers to gain further control of maintenance in later decades.

The replacement parts and maintenance services provided by company agents became a point of conflict between farmers and manufacturers. Manufacturers sometimes defended their agents as the providers of essential expertise in the form of maintenance and repair parts and services. One Canadian manufacturer claimed to be willing to entertain the idea of replacing company agents with Grange agents in 1875 but remained skeptical because “the agents would still be necessary, as the Patrons would require implements to be put in working order, and sometimes kept in order.” He left open the possibility for future development on the issue, leaving Grangers with the thought that their efforts would be more effective if they could canvas for sales themselves, as well as “attend to the working of machinery.”⁷⁰⁶ The McCormick company also appealed to the importance of the machine set-up process to justify the existence of its agents.⁷⁰⁷ Overall, Grange agents were not as involved in machine set-up and repair as manufacturers’ agents were. In fact, manufacturers might ship a machine directly to the buyer based on an agent’s communications alone. The agent thus might not even see, let alone repair or

⁷⁰⁶ “Manufacturers and the Patrons of Husbandry.” *Farmer’s Advocate*, vol. 10, no. 2, February 1875, 23.

⁷⁰⁷ Hirsch, 490-491.

set up, the machines he sold.⁷⁰⁸ The inability or unwillingness of Grange agents to take on some of the maintenance roles of company agents hindered their efforts to win control of systems of machine distribution from manufacturers.

Grangers did make some efforts to address this issue, and some Grange agents did participate in some maintenance work. “County business agents” in Wisconsin set up machines in 1876.⁷⁰⁹ Those agents may have been farmers themselves and would have brought some of their own essential expertise to the task. The state agent of Michigan noted that “the work of setting up the machine is paid for by the company when done by me” in a report on his collaboration with the makers of the Climax reaper and mower.⁷¹⁰ Yet it is unlikely that either state or local Grange agents were as accessible as company agents during the busy harvest season for set-up duties.

The extent to which Grange agents participated in the repair of breakages is unclear, though it does not appear to have been substantial. The Ohio business agent also reported that it was his job as state agent to “correct errors, to repair defects” in machines purchased through the agency.⁷¹¹ The extent to which this responsibility extended into ordinary repairs rather than just defects noted upon arrival is unclear. The state Grange of Michigan advertised the Home sewing machine as warranted to be “kept in repair” for five years. As this company attempted to work with Grange agents rather than its own, it

⁷⁰⁸ “State Agency of Patrons.” *Prairie Farmer*, July 25, 1874, 235.

⁷⁰⁹ *Proceedings of the Fifth Annual Meeting of the Wisconsin State Grange, Patrons of Husbandry* (Milwaukee: Sentinel Company, 1877), 18-19.

⁷¹⁰ “The Climax Reaper and Mower.” *Grange Visitor*, June 1875, vol. 1, no. 3, p. 6.

⁷¹¹ “Ohio Business Agency.” *Ohio Farmer*, vol. 52, no. 10, September 8, 1877, 151.

is possible that Grange agents were at least somewhat involved in repairs, though repairs may instead have been handled more directly by the factory.⁷¹² The Ohio state business agency sold old sewing machines that had been “made over” in 1876 for reduced prices.⁷¹³ It is not clear, however, whether the fixing up of old machines for sale was done by the workers in a sewing machine factory or by Grangers, though the former seems more likely. Overall, while farmers developed machine knowledge and maintenance practices of their own over the middle decades of the century, they seem to have struggled to incorporate those institutionally into the Granges. In their efforts to replace the middlemen of the non-producing classes, they may have neglected the productive parts of agents’ responsibilities as machine maintainers.

Some Grangers were at least aware of maintenance as a problem to be confronted. For instance, in 1874 the *Ohio Farmer* printed a statement of the state Grange of Maryland that requested “manufacturers and dealers in agricultural and farming implements of all kinds to discontinue the practice of demanding exorbitant pay for separate pieces of such, when needed for repairs.”⁷¹⁴ Pressuring manufacturers to live up to their maintenance responsibilities was thus one possible solution for the problem of repair when buying from outside the Grange. It was a different matter when dealing through Grange agents, however. Grangers often sought to promote the manufacturing of farm machinery closer to rural and western regions. Part of their enthusiasm for “home

⁷¹² The handling of repairs directly by factory workers, rather than by territorial agents, was not uncommon in the sewing machine industry. See chapter 2.

⁷¹³ *Journal of Proceedings of the Third Annual Session of the Ohio State Grange*, 87-88.

⁷¹⁴ “Patron Items.” *Ohio Farmer*, vol. 46, no. 7, August 15, 1874, 103.

manufacturers” was rooted in a desire to avoid high freight charges from railroads, but some of it also had to do with making repair parts and factory expertise more accessible to western farmers as well.⁷¹⁵ These solutions were dependent on the implementation of manufacturers and had little impact on the systems that Grangers themselves established.

Granger solutions to the maintenance problem generally concerned individual farmers rather than the entire cooperative systems they endeavored to build. Such solutions might include purchasing repair parts alongside your machine upon its initial purpose.⁷¹⁶ Anticipating possible breakages, this strategy allowed farmers to purchase through their Grange agent and also have parts for repairs on hand if things went awry. They then would not have to worry about tracking down the Grange agent who might not even have repairs on hand. Farmers themselves likely handled most repairs of Grange machines as best as they were able.

Despite the failures of the Grange—and of many machine companies—to adequately address the maintenance problem, both manufacturers and the farm press centered the failures of individual farming families to maintain machines. No matter how defective the machine, deterioration was cast as the individual’s fault. As early as the 1850s, McCormick company agents had complained about farmers who they perceived did not take adequate maintenance and storage precautions.⁷¹⁷ Yet in the 1870s, the

⁷¹⁵ “Home Manufacturers.” *Grange Advance*, October 22, 1873, 4; “Home Manufactories—Are They Practical?” *Grange Advance*, October 29, 1873, 4.

⁷¹⁶ “Billed from A. Tyner, May 31, 1879” in Isaac Beeson, “Account of the Transactions of the Agent of Nettle Creek Grange No. 735” (n.d.), L354, Box 3, Folder 10, Isaac W. Beeson Papers, Indiana State Library.

⁷¹⁷ Hutchinson, *Cyrus Hall McCormick: Seed-Time, 1809-1856*, 365.

question became more paramount in the agricultural and Granger press. The editor of the *Prairie Farmer* lamented not only unnecessary purchases, but also lamented “the lack of care given expensive machinery” as “another source of equal extravagance” which was responsible for “permitting decay.”⁷¹⁸ The republican language of decadence and decay was present in the exhortations that farmers occupy themselves in preventing the decay of their machines. The *Grange Advance* argued that “a break down in the harvest is an expensive luxury” that no farmer should allow himself to take.⁷¹⁹ Grangers themselves, particularly in Granger newspapers, contributed to this discourse and were worried about the extent to which individual farmers kept their machines in order.

Granger papers also took care to point out that, despite the elements of distribution systems that worked against the farmers, lack of care for farm machines was a fault of farmers themselves. The *Grange Advance*, for instance, referred to farm machines left unsheltered and not properly cared for in saying, “this is our wrong.” The article argued that in a world where farmers were “paying too much for what we buy, and getting too little for what we sell,” farmers should be more careful with their machines.⁷²⁰ The next month, another article made the point more explicit: “The fault lies in some measure, at least, with the people who suffer and complain, but who, of course, like all other classes, labor with much more zeal to secure the reform of abuses of which other

⁷¹⁸ “Extravagance in Farm Machinery.” *Prairie Farmer*, March 28, 1874, 97.

⁷¹⁹ “Put Your House in Order.” *Grange Advance*, July 15, 1874, 6; See also, “Editorial Notes” *Grange Advance*, November 26, 1873, 3; “The Fourth at Featherstone.” *Grange Advance*, July 11, 1876, 5.

⁷²⁰ “Their Carelessness with their Implements.” *Grange Advance*, October 22, 1873, 8.

people are guilty than to correct their own.”⁷²¹ Even Grangers themselves thought that the discrete machine maintenance practices—or lack thereof—of farming families and communities needed to be addressed if farming people were going to claim the fruits of the systems of mechanized agriculture they had helped produce.

Granger papers thus advocated repair practices as a part of farmers’ claims to the production of mechanized agriculture. Their writings often included some instructions on how to do certain repairs and maintenance tasks. They also connected repair and maintenance not only to republican ideology through concerns about extravagance and decay, but also to the social and political movement of the Grangers. One article used a pun on the word “movement” to do so:

A great deal is now said about the farmers’ movement. But there is one movement that but little is said about. It is an important movement. It should be talked about in the granges and at all public gathers. We refer to the movement of tools, implements and machines. They should be moved at once from the fields and the sunshine and the storms, into dry and sheltered places.⁷²²

Granger papers also connected the repair and maintenance of machines to the maximization of individual farmers’ profit. The *Farmers’ Union*, for instance, referred to rust as a “greatly yearly loss to all” before offering advice on how to address it: “Slightly rusted articles may be cleaned by rubbing them with pure animal oil and pure whiting or slacked lime.”⁷²³ Another article noted that farmers wasted money on new machines that

⁷²¹ “Extravagance in Agricultural Machines.” *Grange Advance*, November 12, 1873, 6.

⁷²² “A Farmers’ Movement.” *Grange Advance*, November 12, 1873, 8.

⁷²³ “Rust on Implements.” *Farmers’ Union*, January 20, 1872, 5.

ought to instead be patched up and used longer.⁷²⁴ The *Grange Advance* also recommended that farmers consider the maintenance of machinery in terms of profit-maximization when it suggested the idea of a “machine account,” that should include not just the sales price but also “the loss from wear and tear.” The author argued that this “would be very apt to lead to better care of farm implements.”⁷²⁵ Other writers connected proper care of machines not only to operating in the market, but also to best practices of educated and scientific agriculture.⁷²⁶ But they all generally cast the responsibility for machine malperformance as that of individual farmers.

Grangers did not engage in this self-critique of their maintenance practices alone. In fact they engaged in direct arguments with, or at least about, middlemen machine agents as maintainers. A Granger wrote to the *Farmers’ Union* in 1873, seemingly in response to a defense of company agents on their grounds of their efforts to set up and repair machines in the field. In addition to attacking the middlemen as profiteers, the Granger also defended his own maintenance practices and machine capabilities. He wrote of his harvester, “I set it up alone, and did not have to tax my brain very much either. He says I used up the costly tool, but if he will look in my granary, he will find that it is a pretty good machine yet.”⁷²⁷ The Granger nodded towards machine storage and set-up as maintenance practices and asserted his own knowledge of the machine. Grangers

⁷²⁴ “Why Do We Stay Poor?” *Farmers’ Union*, May 24, 1873, 161, taken by the paper from the *Western Rural*.

⁷²⁵ “Farm Accounts.” *Grange Advance*, January 5, 1875, 4.

⁷²⁶ Alonzo Sessions. Correspondence. *Grange Visitor*, August 1877, Vol. 3, No. 5, p. 1-2.

⁷²⁷ “Up Brakes’ Gag.” *Farmers’ Union*, June 14, 1873, 188.

valorized their individual capacities as machine maintainers in the course of their struggles with merchants and manufacturers and based their claims to the systems of mechanized agriculture on their maintenance of machines.

The Grange was unable to fill the place occupied by manufacturers and their agents in the maintenance of machines. It may well be the case that the lack of machine support from Grange agents, or from the smaller machine companies that they had the most success dealing with, made purchasing through the Grange a less attractive option for farmers than it might have otherwise been. Solon Buck even alludes briefly to this possibility.⁷²⁸ Nevertheless, it is important to also note the extent to which the maintenance practices of Grangers in their families and communities made the Grange experiment possible in the first place. Without the decades of machine experience that farming people had by the 1870s, their efforts to build a system of farm machine distribution likely would have been less successful than they ultimately were in the middle years of the decade. Yet the inability of the Granges to address the problems of maintenance within their systems of distribution prevented those systems from challenging the power of manufacturer-controlled distribution systems.

There were some instances that illustrated the possibilities of maintenance within the Grange. Grangers sometimes valorized repair not as a necessary component of farm economy, nor as a signifier of individual republican virtue, but as a weapon in the farmers' struggle over mechanized agriculture. The *Grange Advance*, for instance, argued

⁷²⁸ Buck, 275.

that “there is no way that we know of by which you will so surely beat the extortionate machine men as by taking good care of the machinery you have.” If the farmers could reduce the demand for machines by making their machines last longer, the article argued that prices would necessarily decrease. It also implied that Grange agencies and stores might have more leverage if demand for new machines were not so high.⁷²⁹ Some Grangers thus envisioned maintenance as a strategy to be used to assist in their efforts to assert the place of farmers in mechanized agriculture.

Conversations about machine repair as a tool of Granger activism took place within Granges as well. The Granges of Mower County, Minnesota, organized a “county council” in 1873. One of the first resolutions of that council read:

Resolved, that we do hereby renounce the agency system, and that we recommend to the Patrons of Mower, County, that by repairing old machinery and by helping each other, they will postpone buying any new machinery this year, unless said machinery are extremely necessary.⁷³⁰

The Grangers of Mower County sought to repair their current machines rather than purchase new ones and to thus withhold their consumption from the manufacturers they sought to influence. The addition of the injunction to help one another—presumably by sharing machines and labor—also calls attention to how connected farming peoples’ community practices of labor organization were to both their maintenance practices and their political organizations. While the Mower County resolution and other statements on behalf of repair ultimately left the task of helping one another and of repairing old

⁷²⁹ “Crop Prices, Economy.” *Grange Advance*, August 12, 1874, 2.

⁷³⁰ “Mower County Council.” *Farmers’ Union*, July 26, 1873, 234.

machines to farm families themselves, it nonetheless gestured towards the possibility of institutional maintenance practices.

Grangers carried their concern for repair into later years as well. In 1878 this was apparent in a report of a Grange “Visiting Committee” in Marlette, Michigan. This committee likely formed for purposes of general improvement and scientific agriculture rather than anything directly political. Yet the committee nonetheless carried the same concern about the state of farmers’ maintenance practices, noting in a report of one man’s farm that, “unlike some farmers his tools were housed and in good condition; the repairing, he says, gives him work for rainy days.”⁷³¹ The farmer received his kudos for correct use of his rainy days in repairing his farm alongside a discussion of crop conditions. Granger newspapers also continued to run articles on the importance of keeping machines in repair.⁷³²

Similar discussions about the importance of maintaining farm machinery as well as methods for doing so continued within local Granges. They included discussions of how best to deal with rust as well as what the best way to store different machines might be. These discussions, like the newspaper articles, were as ideological as they were practical, however, as Grangers in the Bloomington Grange of Minnesota discussed the importance of not letting machines go to waste in moralistic terms. There was also a public-facing nature to the concerns about maintenance in the Bloomington Grange, as

⁷³¹ B. A. Wilson. “Report of Committee on Crops and Conditions of Farms.” *Grange Visitor*, September 1, 1878, vol. 3, no. 17, p. 3.

⁷³² “How Farmers Lose Money.” *Grange Visitor*, January 15, 1879, vol. 5, no. 2, p. 6.

one farmer noted in discussion that he “thought it looked very well to see farmers have a place for their utensils and that it spoke very well for the community to see implements generally taken care of and put under cover.”⁷³³ Rather than be the type of farming community that was lambasted by newspapers for its ill-kept machines, the Grangers of Bloomington hoped the farmers of their community would achieve respectability through maintenance practices that included regular washing and oiling as well as adequate storage. As with the newspaper discussions, these solutions to the maintenance problem remained focused on cultivating maintenance habits and practices among individual farm families.

Grangers thus confronted the problem of machine maintenance and repair in their efforts to build state agencies and other cooperative enterprises. Most often, their efforts to address maintenance privatized the problem. Individual farm families—rather than the Grange as an institution—were made responsible for the care of machines. The distribution systems of the Granges were unable to adequately address the problem of maintenance and to take the space in systems of machine maintenance occupied by manufacturers and their agents.

Conclusion

⁷³³ “‘Aug’ Notes on Discussion,” n.d., P2004, Box 1, Folder 2, Bloomington Grange No. 482, Minnesota Historical Society; “‘The Topic for Today Is Care of Farm Machinery’ Notes on Discussion,” n.d., P2004, Box 1, Folder 2, Bloomington Grange No. 482, Minnesota Historical Society.

Grangers differed with manufacturers over quality, maintenance, and access to machines more forcefully than farmers had before. In their efforts to rebalance power within systems of machine purchase and distribution, they confronted the fact that, despite their efforts which brought industrial capitalism to the farm, they were still beholden to forces of greater power in the realms of commercial and financial capitalism. They asserted their rights to the fruits of the technological systems they built on their status as producers. Yet their antimonopolist and producerist ideologies also kept farmers from filling the roles that merchants and manufacturers' agents played in the distribution of farm machines, and they thus struggled to overcome difficulties of machine sales, knowledge, and maintenance.

As farming people and machine manufacturers continued to build and contend for new technological systems in the remaining decades of the century, they would do so in the context of the failures of the Grangers. The lack of farmer-controlled systems for machine maintenance left machine manufacturers to fill that role, and thus solidify their own control of the technological systems of wheat farming through maintenance. Also, after the decline of the Grange, some farming people would make more individual claims to ownership of machines and the technological systems they constituted by claiming the status of inventors.

Chapter Four

My Own Machine: Harvester Tinkering within Farm Systems in the 1880s

E. L. Adair wrote to the McCormick Harvesting Machine Company in 1885 from her home in Kentucky to begin a conversation about her husband's invention. She was forthright about her reason for contacting the company when she wrote, "were his finances sufficient he would patent it independent of anyone else." Yet she did so with some trepidation and insisted that the recipient of the letter "bind yourself to secrecy" before continuing further.⁷³⁴ Her husband, R. H. Adair, then followed up with his own letter in March after having learned that his wife had conducted "quite a bit of correspondence" with the company. He had made a new driving apparatus for the sickles on mechanical reapers. He had about previously written to the Marsh brothers about it, but noted they had "snapped me off so closely it was a couple years before I had the courage to write to any one else." R. H. Adair claimed to have written to D. M. Osborne and the Deering Company as well. Deering had even sent someone to see the machine, but friends had warned the Adairs to be cautious in dealing with company men. They took this advice to heart "and when the fishermen came the game was on alert and the bait would not take." R. H. Adair had insisted that Deering take him to Chicago and provide him with some skilled workmen to build a proper version of his attachment. Deering never did so and the caution of "a poor man" who knew "full well the danger of

⁷³⁴ E.L. Adair to McCormick Harvesting Machine Company [Hereafter M.H.M.C.]. February 26, 1885. C.H.M. Correspondence, Box 96.

dealing with the rich” prevented R. H. Adair from seeking out others. E. L. Adair, nevertheless, had convinced him to do so, perhaps through her own action of writing first on his behalf. R. H. Adair was fearful that machine company men would steal his invention by seeing its general principles and then, “by superior workmanship and some of the terrors to inventors called ‘improvements,’” make a version of the device improved enough to give legal basis to patent it for themselves. He also defended his own mechanical aptitude and insisted he was not a crank. Nevertheless, he admitted he did need help to perfect his device. Adair may have worked as a Minister as well as a farmer, and certainly received help from “some of the old farmers” in his area when working on his attachment. The problem he identified and set out to solve was rooted in the technical and animal systems of farm life. He wrote, “the motion required to give the speed to the sickle is hard to be attained except by such crowding of the team as soon breaks them down.” His attachment would allow the sickle to gain its speed without excess strain to the horses.⁷³⁵

Rural tinkerers like the Adairs attempted to assert some individual agency over, and to gain profit from, their contributions to industrial agriculture. Farming people used the machine knowledge they had built over decades to reshape their machines, often to better adapt them to the farm systems of labor organization, crop cultivation, and animal

⁷³⁵ R. H. Adair to M.H.M.C. March 18, 1885. C.H.M. Correspondence, Box 96. R. H. Adair mentions that his wife corresponded with the company beyond the February letter. The remaining correspondence is not held in the McCormick Collection; The Adairs were Southerners who wrote from Kentucky but may have spent time in Texas as well. See, R. H. Adair and E. L. Adair in 1880 United States Census. Precinct 3, Johnson, Texas. Ancestry.com. Nevertheless, most of those who wrote letters of this kind to McCormick in the 1880s wrote from the Midwest.

husbandry that conditioned machine use on the farm. In fact, their vision of technological development was shaped by the fact that both machines and tinkerers were thoroughly embedded in those farm systems. Rural tinkerers altered and invented machines to be better attuned to their own knowledge, fields, animals, and communities. But farming people were less able to assert control over the complicated inner-workings of new machines like self-binding harvesters than they were of alterations grounded in the relationship between machines and those farm systems.

Machine manufacturers and their agents, as well as consumers and users, have long histories of machine alteration and innovation. Historians have demonstrated the profound transition from a world of independent inventors to one in which technological change came to be driven by large institutions more than by independent patent-holders and proprietors.⁷³⁶ John Nader's extensive analysis of inventors and patent-holders in the harvesting machine industry reveals that this transition began in this industry as early as the 1870s. Nader also identified and named the "inventive professionals" who helped to drive much of the innovation in this industry during these decades as well as the second industrial revolution and the rise of the corporate form in a number of other industries.⁷³⁷

⁷³⁶ Kenneth L. Sokoloff, "Inventive Activity in Early Industrial America: Evidence from Patent Records: Working Paper No. 2707" (National Bureau of Economic Research, September 1988); Kenneth L. Sokoloff and B. Zorina Khan, "The Democratization of Invention During Early Industrialization: Evidence from the United States, 1790-1846: Working Paper No. 10" (National Bureau of Economic Research, December 1989); Floyd L. Vaughan, *The United States Patent System* (Norman: University of Oklahoma Press, 1954); Thomas P. Hughes, *Elmer Sperry: Inventor and Engineer* (Baltimore: Johns Hopkins University Press, 1993); Hughes, *American Genesis*; Noble, *America by Design*; Steven W. Usselman, *Regulating Railroad Innovation: Business, Technology, and Politics in America, 1840-1920* (Cambridge: Cambridge University Press, 2002).

⁷³⁷ John Nader. "The Rise of an Inventive Profession: Learning Effects in the Midwestern Harvester Industry," *Journal of Economic History* 54 (1994): 397-408. For earlier scholarship that also demonstrates

Nevertheless, company men did not shape the human-built world unilaterally. Historians of technology have also demonstrated that consumers shaped the trajectory of technology.⁷³⁸ Beyond shaping technology simply through consumer choice, everyday users also literally shaped them in their homes and garages. Historians have described these actions that blur the boundary between maintenance, alteration, and innovation as “tinkering.” Most studies of tinkering, however, have been written by scholars of the twentieth century. These scholars identify the agency of users and consumers in a world of mass production, interchangeable parts, and cultural consumerism.⁷³⁹ An analysis of tinkering in the nineteenth century, at the beginning of the second industrial revolution, allows us to see the claims made by farming people as producers of technological systems, rather than simply as consumers of machines.

Nineteenth-century farmers tinkered with and made claims about their machines.

Olivier Zunz has briefly argued that the “constant dialogue between implement manufacturers and their customers” was critical to technological innovation in the

the connection between skilled factory labor and innovation in this industry, see, Reynold M. Wik, “Some Interpretations of the Mechanization of Agriculture in the Far West,” *Agricultural History* 49, no. 1 (1975): 73–83; Winder, *American Reaper*, provides the most recent comprehensive treatment of the patterns and “networks” of innovation among skilled laborers and professionals in the harvester industry; On the growth of corporate capitalism, see Wright, “Capitalism and the Rise of the Corporate Nation.”; William G. Roy, *Socializing Capital: The Rise of the Large Industrial Corporation in America* (Princeton: Princeton University Press, 1997); Alfred D. Chandler Jr., *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, MA: Harvard University Press, 1977).

⁷³⁸ Cowan, “The Consumption Junction: A Proposal for Research in the Sociology of Technology.”

⁷³⁹ Franz, *Tinkering: Consumers Reinvent the Early Automobile*; Takahashi, “A Network of Tinkerers: The Advent of the Radio and Television Receiver in Japan”; Tinn, “From DIY Computers to Illegal Copies: The Controversy over Tinkering with Microcomputers in Taiwan, 1980-1984.”; Viridi, “Tinkering with Hearing Aids: Maintenance, Self-Repair, and Disability Agency.”; Oldenziel and Hard, *Consumers, Tinkerers, Rebels: The People Who Shaped Europe*.

industry.⁷⁴⁰ While this observation is certainly true, farming people like the Adairs, were well aware of the power disparity between themselves and the growing firms that dominated the farm machine industries. A closer analysis of the efforts of farm tinkerers demonstrates how farming people made claims to credit for, and profit from, the production of technological systems out of both machines and farm systems in the context of conflict with manufacturers and their agents.

Soliciting McCormick

Nineteenth-century farming people used the knowledge they cultivated in their practices of use and maintenance to alter their machines. Some made claims about the novelty and utility of those alterations and sought the help of companies like McCormick in developing their innovations. The 1880s were a critical point in the harvesting machine industry, as farmers throughout the Midwest and Ontario began to use self-binding harvesters. These machines were larger, more complex, and were composed of more “attachments” than the machines of the middle decades of the century had been. Hundreds of individuals wrote to the McCormick company office in Chicago between 1879 and 1885 to inquire about the company’s interest in an invention or improvement. Sometimes, they also sent more specific requests or descriptions.⁷⁴¹ The McCormick company received correspondence from other manufacturers and patent-holders in the

⁷⁴⁰ Zunz, 154-156.

⁷⁴¹ These letters are held in boxes 78-101 of C.H.M. Correspondence, Wisconsin Historical Society.

industry about patent litigation, territorial rights, and other business matters, but this chapter concerns itself with self-claimed inventors who were not already prominent in the industry. Of the letter writers, E. L. Adair, who wrote about her husband's invention, is the only woman identified, but her correspondence does give a fleeting glimpse into the ways in which women were involved in these exchanges that are usually not visible in the archive. It is difficult to say how many women of farm families were involved in the tinkering that the men of farm families wrote about, but there were likely more than are apparent in the letters.

The company received some similar correspondence before the 1880s. Scattered instances of such correspondence can be found as far back as 1855 and throughout the 1860s.⁷⁴² The company received more letters about inventions in the 1870s, but the volume does not compare to the hundreds of writers in the 1880s.⁷⁴³ Nearly two hundred of the writers from the early 1880s received a response from someone at the company, as indicated by notes left at the top of the letters the company received. These responses

⁷⁴² Ignatius Langer to Cyrus Hall McCormick. December 7, 1855. C.H.M. Correspondence, Box 7; William P. Mason to Cyrus Hall McCormick. May 5, 1857. C.H.M. Correspondence, Box 10; William Schnebly to Cyrus Hall McCormick. April 16, 1867. C.H.M. Correspondence, Box 25.

⁷⁴³ Whether this increase is a result of archival choices on the part of the company, or of an increased number of letters received is unclear. Nevertheless, the 1880s provide a useful moment in the development of these machines and the development of farmers' use of them to explore in depth. For letters in the 1870s, see, A. B. Smith to Cyrus Hall McCormick. June 28, 1872. C.H.M. Correspondence, Box 47; William T. Smith to Cyrus Hall McCormick. June 7, 1872. C.H.M. Correspondence, Box 47; Harrison Alexander to Cyrus Hall McCormick. February 14, 1873. C.H.M. Correspondence, Box 48; John L. Owen to Cyrus Hall McCormick. September 28, 1874. C.H.M. Correspondence, Box 55; William P. Penn to Cyrus Hall McCormick. May 6, 1874. C.H.M. Correspondence, Box 55; C. A. Postley to Cyrus Hall McCormick. December 24, 1874. C.H.M. Correspondence, Box 55; Andrew J. Pierce to Cyrus Hall McCormick. September 27, 1874. C.H.M. Correspondence, Box 55; E. Emmert to Cyrus Hall McCormick. December 12, 1875. C.H.M. Correspondence, Box 57; A. D. Pelton to Cyrus Hall McCormick. April 14, 1875. C.H.M. Correspondence, Box 58; Joshua Pearson to Cyrus Hall McCormick. September 23, 1876. C.H.M. Correspondence, Box 64.

appear to have also increased in the 1880s, though a note indicating the company's lack of interest was left on one in the 1870s, indicating the company may have responded to earlier letters as well.⁷⁴⁴

Many of the letters included descriptions and sketches of the proposed invention, whether it had yet been built or only existed in the author's imagination. Other letters mentioned the inclusion of sketches that were presumably removed by company men.⁷⁴⁵ Their textual and pictorial descriptions demonstrated their machine knowledge and creativity, as well as how they built on top of extant machines as farming people made individual claims to the production of these technologies.

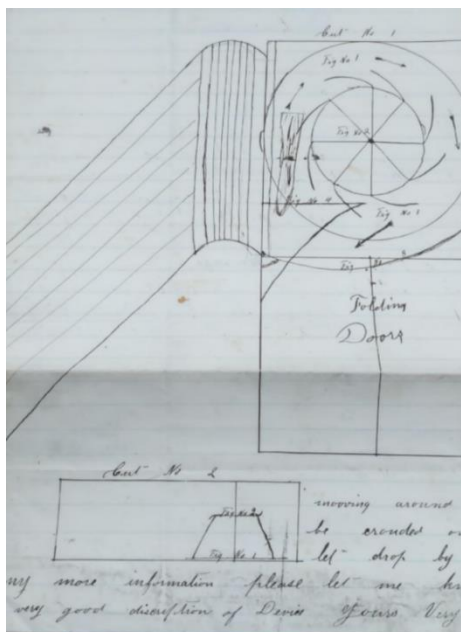


Figure 12: William H. Gifford proposed and sketched a devise for shocking grain intended to be affixed to a McCormick binder while in operation. Gifford's invention was thus one in a long line of attachments—

⁷⁴⁴ Sam Buchanan to Cyrus Hall McCormick. March 21, 1873. C.H.M. Correspondence, Box 48.

⁷⁴⁵ David Maxwell to M.H.M.C. March 9, 1885. C.H.M. Correspondence, Box 99.

including binders themselves—intended to be added to harvesters in these years. William H. Gifford to McCormick Harvesting Machine Company. March 5, 1884. C.H.M. Correspondence, Box 93.

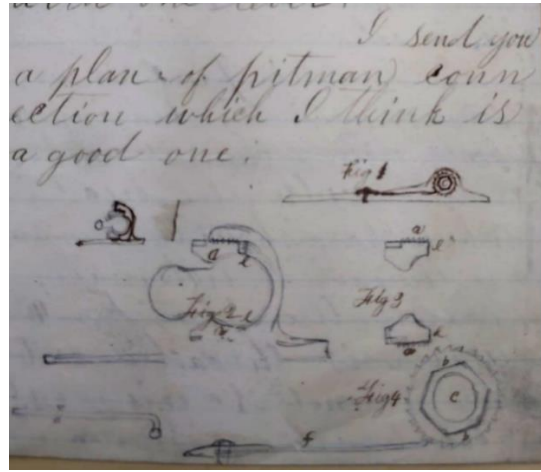


Figure 13: J. J. Knapp proposed a devise for raising and lowering the cutting apparatus. “Tilters” allowed farmers to avoid the obstructions of the natural world while harvesting and thus helped adapt machines to the environmental and crop conditions of farmers’ fields. They also, however, were sometimes difficult to make work with the internal designs of existing harvesters. Pictured here is the way in which Knapp would alter the “Pitman” of a reaper to allow his tilting device to function within the machine. Knapp’s design thus had to negotiate between the systems of crops and fields and the internal systems of existing machine designs. J. Knapp to McCormick Harvesting Machine Company. May 26, 1884. C.H.M. Correspondence, Box 94.

Occupations of Inventors of Harvester Reels, Equalizers, and Knotters

Biographical information about prospective inventors who either wrote to the McCormick company or received patents from the U.S. patent office reveals the connection of different harvester components to the systems of mechanized agriculture that farming people had produced over the past decades. My analysis compares six sets of individuals who either received patents for, or who wrote to the McCormick company claiming to have invented, three different types of harvester components: knotters, reels,

and equalizers.⁷⁴⁶ Knotters were the mechanism of self-binding harvesters that performed the motion of tying the knot around the bound grain. They were thus intricate and metal mechanisms that handled twine or cord. They had only achieved any widespread use in the 1870s. A harvester reel was an arm that pushed or held the grain in place as the cutting mechanism came into contact with the stalk. They were usually wooden and had been a part of reaping and mowing machines since the 1840s. Finally, draft equalizers—also called eveners or double-trees—were a part of the fixture by which the horses pulled the machine forward.⁷⁴⁷ They were designed to evenly distribute the weight onto the

⁷⁴⁶ The sets are as follows: Set 1: 38 patentees for knotters between 1879 and 1889. Set 2: 22 claimed inventors of knotters in C.H.M. Correspondence between 1882 and 1885. Set 3: 39 patentees for harvester reels between 1879 and 1885. Set 4: 12 claimed inventors for harvester reels in C.H.M. Correspondence between 1882 and 1885. Set 5: 48 patentees for draft-equalizers, double-trees, and draft-eveners between 1880 and 1883. Set 6: 12 claimed inventors for equalizers, double-trees, and eveners between 1883 and 1885.

Some of the individuals in these sets made multiple claims or had multiple patents. A few both wrote to the McCormick company and received a patent during these years. The sets include inventors from either the correspondence or the patent record who claimed patents for entire machines, such as a “self-binding harvester,” that may have included all three of these components only if they made distinct claims for one of the three components. The choice to sample different year ranges, particularly for sets 1, 3, and 5, which concern the patent record, was made in order to have samples of similar sizes despite the difference in numbers of patents received for each device. Many more patents were issued for equalizers than for knotters in these years, so a greater number of years was incorporated into set 1 for a larger sample.

The information on patentees was taken first from the annual reports of the U.S. patent commissioner, which lists patents issued alphabetically by type of claim, and then the official gazettes of the patent office were checked for further information on the patentees themselves. See, *Annual Report of the Commissioner of Patents* (Washington: GPO), Hathi Trust Digital Library.

<https://catalog.hathitrust.org/Record/002138126>; *Official Gazette of the United States Patent Office* (GPO, Washington), Hathi Trust Digital Library.

<https://catalog.hathitrust.org/Record/000498155?type%5B%5D=all&lookfor%5B%5D=gazette%20patent%20office&ft=>. This information was also used to identify the individuals further in the U.S. censuses of 1870, 1880, and 1890, as well as via more limited use of census non-population schedules for agriculture and city directories via Ancestry.com. The information sought includes, but is not limited to, geographic location, occupation, and whether or not the patent in question was assigned, in part or in full, to another party upon issue.

⁷⁴⁷ In addition to double-tree, single-tree, whiffle-tree and other such “trees” were terms used to describe draft equalizers, particularly for use when only one draft animal was involved. For the purposes of these

shoulders of multiple horses. These devices had been around for a long time, and farmers used them on wagons and plows as well as harvesters, but McCormick sold harvesters with their own equalizers during the 1880s, and they were a critical part of the whole machine. An analysis of the claimed inventors of these machine components shows how farming people were able to maintain more command of those machines that were most directly connected to use within farm systems as well as those that were most directly connected to the machines that they had spent the past decades learning. New devices like self-knotting mechanisms—composed of more intricate mechanical systems and less dependent on relationships with crop and animal systems—became the purview of machinists and mechanics rather than of farmers.

Midwestern farmers were represented among those who claimed invention. Midwesterners predominate all six sets compared to any other region, in part because McCormick was a Midwestern company by the 1880s, but also due to the importance of the Midwest to the entire farm machine industry, and thus also the familiarity of Midwestern farmers with machines.⁷⁴⁸ In addition to other regions of the United States, there were some scattered patentees and letter writers from Ontario as well.⁷⁴⁹ Farmers and farm workers were represented in all six sets, although they only constituted a simple

sets, only those inventions identified in either letters or the patent records as eveners, equalizers or double-trees were considered because harvesters were typically pulled by at least two draft animals.

⁷⁴⁸ The proportions of Midwesterners to total for each set is as follows, Set 1: 26/38. Set 2: 17/21. Set 3: 30/39. Set 4: 9/12. Set 5: 36/48. Set 6: 7/12.

⁷⁴⁹ Josiah Lucas to Cyrus Hall McCormick. February 6, 1885. C.H.M. Correspondence, Box 99; David Maxwell to M.H.M.C. March 9, 1885. C.H.M. Correspondence, Box 99; Robert Christie to M.H.M.C. February 26, 1883. C.H.M. Correspondence, Box 88; Bucky and Stevenson to M.H.M.C. June 16, 1885. C.H.M. Correspondence, Box 97.

majority in three of them. They were the majority of those inventors of reel and equalizer inventors who wrote to McCormick and could be identified with census records, and among the patentees of equalizers when including among farmers those individuals who listed a dual occupation of both farming and some type of trade. Tradesmen, machinists, and manufacturers were likely more able to profit from their claims and thus more likely to take out patents or attempt to sell their tinkering as invention. Nevertheless, the presence of farmers among these claimants to invention demonstrates the efforts of farming people to assert their status as producers of mechanized agriculture.

Farmers or farm workers were better represented in the sets for the older technologies of harvester reels and equalizers than they were in the sets for new mechanical knotters. Only five of the thirty-one individuals who received patents for knotters between 1879 and 1889, and whose occupations could be identified, were farmers. Fifteen were employed in some mechanical trade, including machinists, draughtsmen, and supervisors or foremen of manufacturing operations. Proprietors of manufacturing operations, company agents, and individuals who fit the description of Nader's "inventive professionals" were represented in smaller numbers. Occupational proportions of those who wrote to McCormick about their knotters were more evenly distributed among farmers and tradesmen. Three farmers, and an additional farmer-blacksmith, did so, alongside five business proprietors—at least three of whom were engaged in business unrelated to harvesting machines—and five tradesmen. The lesser proportion of tradesmen writing to the McCormick company than receiving patents likely

has to do with those workers assigning parts of their patents to employers. Twelve of the fifteen tradesmen who received knotter patents assigned some portion of their patent rights to someone else, often an employer, upon issue. It was far less necessary to write to a manufacturer about one's invention if that invention was already assigned to a manufacturer. Manufacturers and their employees were most represented as the inventors of these new and intricate mechanical knotters.

The proportion of tradesmen to farming people is nearly flipped in the case of harvester reels. Fourteen of the thirty-three patentees who could be identified were farmers and only five were employed as tradesmen—though company agents, merchants, and professional inventors were included among the remaining fourteen. Only six of the thirty-nine reel patents were assigned to another party upon issue. The greater proportion of farming people among the inventors of reels and knotters arises from reels being an older technology that farmers had already come to know over the past decades of machine use and maintenance; whereas knotters were not used widely until the 1870s. Additionally, knotters were made of small metal components whose repair required machine-shop and foundry skills and materials. While these were not completely missing from Midwestern farms, they were less common than the carpentry skills and materials necessary for dealing with reels. As a newer technology, knotters were closer to the forefront of the industry from the perspective of manufacturers, who often looked for innovations in their shops. It is difficult to draw much about reel inventors who wrote to the McCormick company because four of the twelve could not be identified in census

records, but of those identified, five were farmers and none were tradesmen—alongside two merchants and one inventive professional.

Equalizers, which were both an older technology and one connected to the animal systems of grain farming, likewise saw a greater proportion of farmer-inventors. Like reels, equalizers involved both wooden and metal components, but they relied more on wrought iron than cast iron or other metals. They were also the oldest technology of the three, so farming people had ample experience with them. Nineteen of the forty-two patentees who could be identified were farmers or farm workers and ten were tradesmen. There were an additional five individuals who were both farmers and tradesmen. Among the tradesmen, and among the five farmer-tradesmen, blacksmiths were better represented than among the inventors of the other two components. There were also fewer tradesmen who appeared to work in urban factories, like draughtsmen or machinists. The only machinist listed was also listed as a farmer and a blacksmith by the 1880 census. Findings for inventors of equalizers who wrote to the McCormick company also show a majority of farmers, with seven of the twelve identifiable as farmers or farm workers and only two non-farmers identified. The greater representation of farmers and blacksmiths in the sets for equalizers also has to do with their place as a technology more firmly rooted in rural social life and less dependent on foundries. They could be used for wagons or plows as well as harvesting machines. They also were more closely connected to the animal systems that drove these machines. Farming people had decades worth of experience

making their machines work with their horses, and thus made more claims to invention in this line of machine components.

Appealing to either the patent office or to McCormick was a way for farmers to claim individual ownership of a contribution to the systems of mechanized farming. The fact that they were more present among the inventors of those machine components that were most connected to farm systems and to machine components they were familiar with reveals how complex machines like self-binding harvesters changed how farmers related to harvesting technologies. The improvements and inventions that relied most on making machines work with the farm systems of rural life were those in which farmers made the strongest claims to technological authority. Their claims to agency over, and the fruits of the systems of, mechanized agriculture were thus rooted in the farm systems that constituted important parts of the technological systems of industrial agriculture.

“You Owe Me Much More than I Owe You:” Farmers’ Claims in the Harvester Industry⁷⁵⁰

Prospective inventors made claims about their own ownership of both machines and the technological systems they were a part of. Farming people interacted with professionals of various sorts when attempting to pitch their machines to manufacturers. Local agents, factory professionals, and patent lawyers were involved in the business of

⁷⁵⁰ Quotation from Joshua Pearson to Cyrus Hall McCormick. December 8, 1884. C.H.M. Correspondence, Box 95, also cited below.

turning a farmer's idea into something useful to manufacturers. Prospective inventors knew they were contacting an often-unreceptive McCormick from an unequal position in the political economy of patent management. Their claims were efforts to make some profit from their contributions to the technological systems of industrial farming, but also to protest the claims of manufacturers to sole production and control of those systems.

Letters were most often read and received by the "inventive professionals" that Nader describes.⁷⁵¹ These men were hired from the ranks of company agents, experts, and factory men to pursue new patents and machine innovation. Some of the letter writers addressed their correspondence to the company itself, rather than to Cyrus Hall McCormick or Cyrus Hall McCormick Jr., and often began them with a salutation of, "gentlemen." They thus may have been aware of the inventive professionals and their role in receiving and fielding ideas. Farmers knew that they approached not Cyrus Hall McCormick himself, but an emerging corporate structure.

In fielding these letters, McCormick company men asserted themselves as the sole arbiters of claims about agricultural technology. Professionals like Paul Arnold, Charles Colahan, and William Baker would indicate that they had read and addressed a piece of correspondence.⁷⁵² Baker was the highest ranking of these and often made decisions, but occasionally Cyrus Hall McCormick or Cyrus Hall McCormick Jr. would leave a note indicating their opinion as well, such as when the younger wrote atop a letter: "a crank—I

⁷⁵¹ Nader, "The Rise of an Inventive Profession."

⁷⁵² D. H. Churchill to Cyrus Hall McCormick. January 12, 1883. C.H.M. Correspondence, Box 88; Jacob Dunstedter to Cyrus Hall McCormick. March 5, 1883. C.H.M. Correspondence, Box 88; Fred S. Gable to Cyrus Hall McCormick. June 14, 1884. C.H.M. Correspondence, Box 93.

remember him,” indicating that the writer and his idea should be dismissed.⁷⁵³ Sometimes inventive professionals would send a letter up the chain, such as when one delivered a letter to McCormick with instructions to “talk it over with Mr. Baker.”⁷⁵⁴ Debates about the validity of a writers’ idea seem to mostly have occurred in person, and out of the archival record, but that they occurred is apparent.⁷⁵⁵ Inventive professionals sometimes wrote positive notes, such as when Baker described a proposed nut lock as “more practical than any I have seen.”⁷⁵⁶ They also noted when they thought there was nothing worth looking into, either because the proposal was not new, was too “heavy and expensive,” or simply “looks bad.”⁷⁵⁷ Writers, for their part, preferred more direct feedback from the professionals about why their ideas were rejected, as L. Randell later wrote, “I wish you had stated your points of objection.”⁷⁵⁸ Yet in refusing to argue or engage with the inventors of unwanted designs, inventive professionals again asserted their control of the interactions. Inventive professionals took up posts as gatekeepers of innovation in the industry and interfaced with the public on behalf of the company. In doing so, they asserted their own place as the arbiters of progress and evaluators of technology.

⁷⁵³ R. Manrid to M.H.M.C. July 17, 1885. C.H.M. Correspondence, Box 99.

⁷⁵⁴ E. L. Bracken to M.H.M.C. April 2, 1884. C.H.M. Correspondence, Box 92.

⁷⁵⁵ See, for instance, the commentary notes written on E. W. Jenkins to M.H.M.C. October 20, 1884. C.H.M. Correspondence, Box 93.

⁷⁵⁶ H. Spadone to F. B. Kendall. May 13, 1882. C.H.M. Correspondence, Box 86.

⁷⁵⁷ E. D. Bowly to M.H.M.C. January 6, 1883. C.H.M. Correspondence, Box 87; Alex Paton to M.H.M.C. October 24, 1885. C.H.M. Correspondence, Box 100; Frank Winston to McCormick and Co. July 10, 1885. C.H.M. Correspondence, Box 101.

⁷⁵⁸ L. Randell to M.H.M.C. September 5, 1885. C.H.M. Correspondence, Box 101.

Professionals and prospective inventors held conflicting ideas about how this process should be undertaken as they continued to contest each other's claims as the producers of industrial farming. When the professionals considered something worthwhile, they often encouraged the writer to send a sketch or a model. Many writers did so, including self-identified farmer Samuel Ray.⁷⁵⁹ Others did not have models and had not taken any material steps to build their inventions yet, because some, like Aaron Burntrager, had "just struck the idea and have no model."⁷⁶⁰ Some, however, felt no need to send models as they had already built full machines.⁷⁶¹ Even when writers had the ability to send models, some expressed skepticism about doing so. One even reported that someone in the McCormick office had stolen the model he had sent.⁷⁶² Others worried about shipping costs. William Piatt refused to send a model until after the company paid him for at least half of the shipping cost.⁷⁶³ McCormick's inventive professionals also asked would-be inventors to visit Chicago to demonstrate their claims.⁷⁶⁴ After some correspondence, some writers did go and visit the McCormick company factory.⁷⁶⁵ Yet letter writers, especially farmers, often wanted McCormick men to come and visit them

⁷⁵⁹ Samuel Ray to M.H.M.C. January 26, 1885. C.H.M. Correspondence, Box 100; A. Shoboda to Cyrus Hall McCormick. February 9, 1885. C.H.M. Correspondence, Box 101; P. A. Spicer to M.H.M.C. October 14, 1885. C.H.M. Correspondence, Box 101.

⁷⁶⁰ Aaron Burntrager to Cyrus Hall McCormick. July 6, 1882. C.H.M. Correspondence, Box 83.

⁷⁶¹ H. M. Weaver to McCormick Harvesting Machine Company. December 11, 1883. C.H.M. Correspondence, Box 92.

⁷⁶² M. B. Sampson to M.H.M.C. July 13, 1882. C.H.M. Correspondence, Box

⁷⁶³ William M. Piatt to M.H.M.C. September 5, 1882. C.H.M. Correspondence, Box 86.

⁷⁶⁴ Butler to William R. Baker. 1883. C.H.M. Correspondence, Box 87.

⁷⁶⁵ Henry C. Mumma to McCormick and Company. July 29, 1885. C.H.M. Correspondence, Box 100; Ben J. Rogers to M.H.M.C. January 28, 1885. C.H.M. Correspondence, Box 100; Andrew Stark to Charles C. Colahan. February 20, 1882. C.H.M. Correspondence, Box 87.

instead. William H. Payne of Iowa, for instance, inquired, “Do you propose to send a man out to see my new low down harvest binder?” Others implored that the company send an “expert” to come and see the machine in operation on local farms.⁷⁶⁶ H. M. Weaver mentioned the possibility of sending a local agent but made clear that he would prefer if a general agent or expert could make it out to see his machine.⁷⁶⁷ Prospective inventors, who did not have the funds to travel, and company men, who had little incentive to be accommodating, quibbled about which should accommodate the other.

Farming people argued that manufacturers should make a greater effort to accommodate them in this process based on their own responsibilities as producers and their precarious economic position which left them unable to tolerate loss. The expense of travel was significant, especially if one was not sure just how seriously the company took their claims. Farming people also had labor needs, as one wrote, “I am a farmer and working season is on hand.”⁷⁶⁸ Yet “working season” was also the best season for testing harvest machines, as they were made for the same purpose that made travel difficult for farmers in the late summer. Some writers also worried about the dangers of transporting their machines, as E. G. Bracken wrote that he was “unwilling to move it until you have thoroughly examined it.”⁷⁶⁹

⁷⁶⁶ J. H. Rose to M.H.M.C. May 27, 1885. C.H.M. Correspondence, Box 100; J. R. Beachler to McCormicks. June 20, 1883. C.H.M. Correspondence, Box 87.

⁷⁶⁷ H. M. Weaver to M.H.M.C. December 11, 1883. C.H.M. Correspondence, Box 92.

⁷⁶⁸ Silvester Bros. to M.H.M.C. March 20, 1884. C.H.M. Correspondence, Box 96.

⁷⁶⁹ E. G. Bracken to M.H.M.C. March 9, 1882. C.H.M. Correspondence, Box 97.

Aware of the inequality of the situation in which they approached McCormick, many writers expressed suspicion of, and challenged, the company. They sought assurances from the company before giving models or details.⁷⁷⁰ Strawther Sisson Jr. maintained that his skepticism and reluctance to share details was at the behest of a lawyer.⁷⁷¹ G. W. Thomas grounded his skepticism in personal experience and accused McCormick of stealing a previous design of his. However, he also mentioned another design he hoped to sell. This time, however, he was more reticent about details.⁷⁷² Others claimed that the McCormick company had stolen their ideas as well. B. W. Sutherland, for instance, claimed that McCormick was using his design for a three-horse equalizer and, after a series of complaints, planned to take the company to court, writing, “though I never had a shadow of hope of success I think I have lived long enough to have made some progress in a knowledge of human nature and especially of the nature of men of great wealth.”⁷⁷³ The distrust with which many writers approached the company showed that they understood that they approached the company from an unequal position in their efforts to shape the farm machine industry. Nevertheless, they lodged their protest against McCormick’s authority within the farm machine industry and asserted their own ownership of the machines at work on the farm.

⁷⁷⁰ H. L. Gantt to M.H.M.C. July 1, 1883. C.H.M. Correspondence, Box 83.

⁷⁷¹ Strawther Sisson Jr. to M.H.M.C. July 25, 1885. C.H.M. Correspondence, Box 101.

⁷⁷² G. W. Thomas to M.H.M.C. December 29, 1885. C.H.M. Correspondence, Box 101.

⁷⁷³ B. W. Sutherland to M.H.M.C. August 22, 1885. C.H.M. Correspondence, Box 101.

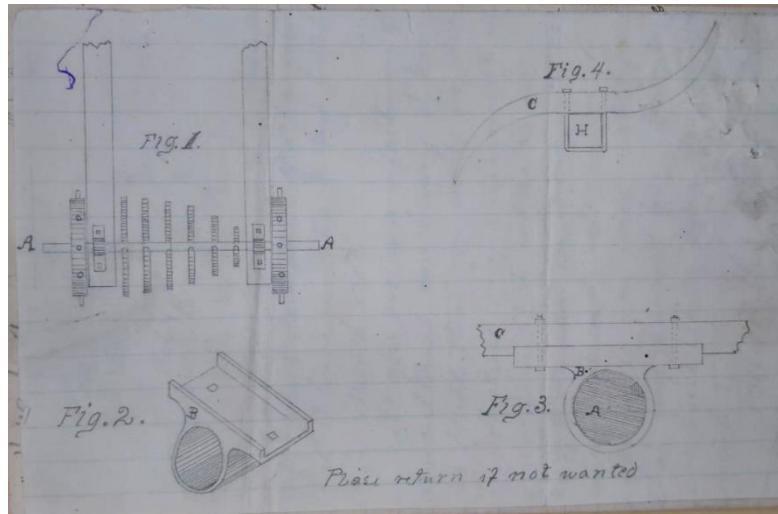


Figure 14: The note at bottom of this sketch instructs the reader of the letter to return the sketch if the company has no use for it, indicating the author was interested in protecting the secrecy of his plans. Prospective inventors who wrote to the McCormick company often expressed some consternation about doing so, reflecting their understanding that they entered the conversation in a position of much less power. Charles P. Lewis to McCormick Harvesting Machine Company. January 3, 1884. C.H.M. Correspondence, Box 94.

Even farmers who had served as McCormick agents accused the company of nefarious practices regarding their designs. William Johnson had become an agent for the McCormick company and made an improvement to the machine in 1871. According to his brother, Johnson had “made a sort of arrangement” with some of McCormick’s men to get the device built. McCormick paid Johnson \$100 and gave him a silk dress for his wife, with the understanding that the company would pay more should the improvement turn into a success. Johnson asserted that the improvement was now a crucial part of McCormick machines, yet his brother remained poor despite having “been for more than sixteen years your faithful agent.” Johnson also cited the opinion of another local McCormick agent, L. Shepperd, that the improvement was worth as much as ten dollars

for every machine sold.⁷⁷⁴ Farmer-agents thus made their own claims—and supported one another’s claims—to the production of mechanized agriculture and condemned McCormick for profiting from their contributions.

Yet the company did attempt to settle with some writers who claimed to have had their patents stolen. Charles Colahan offered \$1,000 to settle with Amos Rank over a similar concern, though Rank rejected the offer as an insult and resolved to go to court nonetheless.⁷⁷⁵ The accusations demonstrate the level of distrust and skepticism with which prospective inventors approached McCormick in the midst of conflicts between farmers and manufacturers.

Inventive professionals largely made decisions about how to handle claimants from the home office in Chicago, but some did travel to rural areas looking for patents to buy. Charles Colahan was one such professional. He sometimes worked for the company and sometimes operated more on his own. He offered “cash paid to inventors” as well as “cash advanced to develop useful inventions” in the *Farm Implement News* during the 1880s.⁷⁷⁶ Some of the letters discussed were, in fact, addressed to Colahan instead of to McCormick or to the company, while others referenced working with him.⁷⁷⁷ Colahan’s

⁷⁷⁴ T. S. Johnson to Cyrus Hall McCormick. June 2, 1882, July 15, 1882, December 21, 1882. C.H.M. Correspondence, Box 84; T. S. Johnson to Cyrus Hall McCormick. July 17, 1883. C.H.M. Correspondence, Box 89.

⁷⁷⁵ Amos Rank to M.H.M.C. January 2, 1882. C.H.M. Correspondence, Box 86.

⁷⁷⁶ Advertisements. *Farm Implement News*, vol. 6, no. 8, June 1885, 3. Hathi Trust Digital Library.

<https://babel.hathitrust.org/cgi/pt?id=chi.102745306&view=1up&seq=1>.

⁷⁷⁷ C. W. Henshaw to Charles C. Colahan. February 20, 1882. C.H.M. Correspondence, 84; B. B. Morgan to Charles C. Colahan. February 1, 1882. C.H.M. Correspondence, 85; Joseph Stewart to Charles C. Colahan. May 4, 1882. C.H.M. Correspondence, 87. Other inventive professionals also received letters directly to them. See, for instance, M. M. Hooton to Paul Arnold. November 28, 1884. C.H.M. Correspondence, 93.

searches for patents could turn up empty, such as when he received a reply from one individual that the patent rights he was seeking had already been sold.⁷⁷⁸ On other occasions, he was successful and managed to buy patents. Colahan wrote to inform McCormick in the mid-1870s that he had bought a reel patent, which he claimed was worth \$10,000, for only \$200 near Harrisburg, Pennsylvania. He argued that this action made McCormick “master of the situation” and promptly asked for a renewal of his contract.⁷⁷⁹

Farmer-inventors distrusted Colahan and McCormick together as both represented the “middlemen and monopolists” with whom they struggled for recognition of their contributions to mechanized agriculture. One wrote to Cyrus Hall McCormick that he had entered into an agreement with Colahan under the impression that doing so meant entering into an agreement with the McCormick company. He wanted to know what the situation actually meant for him.⁷⁸⁰ Joshua Pearson, on the other hand, did not see a distinction between Colahan and the McCormick company, but believed that both had stolen from him. Pearson had written to McCormick in 1876 with an idea for a self-binding harvester.⁷⁸¹ He wrote to Colahan and McCormick and accused them of stealing from him under the guise of a partnership he had entered into with Colahan. Pearson moreover believed that Colahan had shopped the idea to a number of other manufacturers

⁷⁷⁸ L. A. Scoville to Charles C. Colahan. February 18, 1882. C.H.M. Correspondence, 86

⁷⁷⁹ Charles C. Colahan to Cyrus Hall McCormick. October 11, 1875. C.H.M. Correspondence, Box 57.

⁷⁸⁰ Paul G. Hanson to Cyrus Hall McCormick. June 28, 1885. C.H.M. Correspondence, Box 88.

⁷⁸¹ Joshua Pearson to Charles C. Colahan. August 25, 1884. C.H.M. Correspondence, Box 95; Joshua Pearson to Cyrus Hall McCormick. August 25, 1884, October 25, 1884. C.H.M. Correspondence, Box 95.

as well as McCormick. Pearson must have also had some debt owed to the McCormick company for a machine he purchased, because he replied, in December 1884 that he would not pay a \$50 debt “on the ground that you owe me much more than I owe you.”⁷⁸² Pearson’s experience with Colahan and the company shows that farmers, nearly a decade after the Granger activism of the 1870s, still felt robbed by the monopolist and the middleman. They also claimed that they were the true producers of the technological systems of mechanized agriculture, even if merchants and manufacturers reaped the profits.

Yet some farmers and other writers also attempted to profit from their contributions to mechanized agriculture in another way—by joining the ranks of agents and inventive professionals. Brothers, George T. and Daniel Murray, for instance, asked if there were any openings as machine experts while also trying to sell McCormick their improved harvester reel.⁷⁸³ H. R. Ingledue, on the other hand, had already worked as an expert for Walter A. Wood, another reaper manufacturer, and was instead hoping that his experience would help him sell his inventions to McCormick.⁷⁸⁴ Others, like O. O. Storle, were already nearing the position of William R. Baker and Paul Arnold, but perhaps a bit on the outside of the company structures. Storle had a professional relationship with McCormick for a while but seems to have spent a good deal of the early 1880s attempting

⁷⁸² Joshua Pearson to Cyrus Hall McCormick. December 8, 1884. C.H.M. Correspondence, Box 95.

⁷⁸³ George T. Murray and Daniel Murray to Cyrus Hall McCormick. April 30, 1885. C.H.M. Correspondence, Box 100.

⁷⁸⁴ H. R. Ingledue to M.H.M.C. September 5, 1882. C.H.M. Correspondence, Box 84.

to get the company to buy more of his patents.⁷⁸⁵ Other inventors set up operations more typical of independent inventors with their own shops and even small manufacturing enterprises.⁷⁸⁶ Yet innovation in the harvesting machine industry continued to follow a trajectory away from those independent inventors and towards professionals employed by machine companies.

Another group of company men, local and general agents, also monitored and reported on possible inventions. Agents often attempted to facilitate communication between the company and inventors who they had met and were impressed by.⁷⁸⁷ Agents certainly interacted with these would-be inventors as well. Agent R. B. Smith recommended a mower improvement to the company and noted that “the inventor is anxious you should see it.”⁷⁸⁸ Agents visited inventors who were farmers as well as those who were tradesmen of various types.⁷⁸⁹ Agents often met these inventors—farmers or otherwise—at local and state fairs. A. E. Mayer wrote to McCormick with an image of John Theobald’s improved reel, which he had examined at a local fair in Toledo, noting that he believed it “possessed merit.”⁷⁹⁰ Letter writers who wanted a company man to come and see their invention in action also requested that the company send someone to a

⁷⁸⁵ See Storle correspondence in C.H.M. Correspondence, Box 82, Box 87, and Box 91.

⁷⁸⁶ William H. Cole to M.H.M.C. April 29, 1883. C.H.M. Correspondence, Box 88; W. C. Hayden to M.H.M.C. September 5, 1882. C.H.M. Correspondence, Box 84.

⁷⁸⁷ G. W. Wilson to M.H.M.C. February 18, 1882. C.H.M. Correspondence, Box 87; E. H. Everett to M.H.M.C. July 13, 1883. C.H.M. Correspondence, Box 88.

⁷⁸⁸ R. B. Swift to M.H.M.C. September 28, 1885. C.H.M. Correspondence, Box 101.

⁷⁸⁹ E. C. Beardsley to M.H.M.C. May 1, 1882. C.H.M. Correspondence, Box 82.

⁷⁹⁰ A. E. Mayer to M.H.M.C. September 18, 1882. C.H.M. Correspondence, Box 85; Mayer also recommended other devices and inventors he encountered in his correspondence with the company. See, for instance, A. E. Mayer to M.H.M.C. February 20, 1882. C.H.M. Correspondence, Box 85.

local fair in which it would be on display, or simply noted that their machine had been displayed at a particular fair recently.⁷⁹¹ Agents could also initiate communication. B. L. Stewart, for instance, first wrote to the company when he heard from a local agent that McCormick might be interested in his “independent reaper.”⁷⁹² Agent Ben Craycroft reported on multiple possible inventors in the same letter when he wrote to the company in March 1884. He reported on a pitman that a local boy had made as well as another invention made by a man named Clemison, who Craycroft described as “peculiar” and remarkably skittish about sharing any information about his invention.⁷⁹³ McCormick company agents thus took their knowledge of machines out into the rural Midwest, where it was met with the knowledge of farming people in their communities.

Agents also played a role as arbiters of invention, offering opinions on possible inventions and innovation, and strengthening their own role as arbiters of mechanized agriculture alongside the professionals. Sometimes they simply passed information along, such as when general agent S. W. Chapman sent along a letter he received from a pair of local dealer-agents who claimed an invention.⁷⁹⁴ On other occasions, agents weighed in on the quality of the device in question. Agent E. C. Beardsley stated an opinion that Nathan Jewett’s proposal for a harvester reel was not good in the same letter that he

⁷⁹¹ Charles Miller to M.H.M.C. September 17, 1885. C.H.M. Correspondence, Box 100; Adam H. Bell to Cyrus Hall McCormick Jr. June 29, 1885. C.H.M. Correspondence, Box 97.

⁷⁹² B. L. Stewart to Cyrus Hall McCormick. February 18, 1882. C.H.M. Correspondence, Box 87.

⁷⁹³ Ben Craycroft to M.H.M.C. March 28, 1884. C.H.M. Correspondence, Box 93.

⁷⁹⁴ S. W. Chapman to M.H.M.C. . May 29, 1883. C.H.M. Correspondence, Box 88; W. D. Sherman to S. W. Chapman. May 28, 1883. C.H.M. Correspondence, Box 88.

recommended Jewett's design for another device.⁷⁹⁵ Ben Craycroft described a proposed innovation from another pair of dealer-agents as "an impossibility" in 1883.⁷⁹⁶ When agents were impressed with a device, however, the makers of that device let the company know. Local agents were often included in the lists of testimonials given alongside descriptions and sketches of machines sent.⁷⁹⁷ Farmer E. E. Stevenson noted that "your agents at St. Charles McElhaney and Rose will testify to the truthfulness of my statements."⁷⁹⁸ While agents acted as arbiters on behalf of companies, they also sometimes operated from perspectives closer to rural communities and thus bolstered the claims of farmers to the production of mechanized agriculture through their inventions. They offered manufacturers an understanding of the perspectives of farmers while continuing to represent the company's interests.

Agents also offered their own machine alterations as improvements for the company to consider, but in doing so had to approach the inventive professionals of the company as outsiders. Alongside those dealer-agents who wrote to Craycroft and Chapman, some wrote directly to the company or its inventive professionals. The publication in which Colahan advertised to buy patents, *Farm Implement News*, was, in fact, a publication for machine dealers. These dealers often built attachments specifically for the McCormick machines that they handled, such as when George L. Roby designed a

⁷⁹⁵ E. C. Beardsley to M.H.M.C. May 1, 1882. C.H.M. Correspondence, Box 82.

⁷⁹⁶ Ben Craycroft to M.H.M.C. November 17, 1883. C.H.M. Correspondence, Box 88.

⁷⁹⁷ B. M. Pilliam to M.H.M.C. 1882. C.H.M. Correspondence, Box 86; John H. Ingersoll. August 27, 1885. C.H.M. Correspondence, Box 98.

⁷⁹⁸ E. E. Stevenson to M.H.M.C. January 11, 1883. C.H.M. Correspondence, Box 91.

platform attachment for the McCormick “Daisy” reaper.⁷⁹⁹ Dealers also offered their experience working with machines as evidence that they knew enough about them to have something to add to their technological development.⁸⁰⁰ Even the employees of dealer agents could be involved in machine tinkering. One self-described “poor boy” who worked for a dealer, wrote to the company to propose another design of a platform that could be added to the Daisy reaper.⁸⁰¹ Non-dealer agents wrote to the company of their improvements as well. O. B. Drury, for instance, began pitching his improved pitman to the McCormick company home office in 1882, but continued to write about it through 1885.⁸⁰² Yet the inventive professionals in Chicago were not so enthusiastic about it. Baker thought that it was not well suited to McCormick machines, and he complained to others in the McCormick home office about Drury’s frequent correspondence on the subject.⁸⁰³ Josiah Knopf, a sub-agent for A. E. Mayer in Troy, Ohio, offered a couple inventions to the company in 1882. The one that Mayer was most interested in, and recommended to the company, was a set of “cleaning discharge arms” to keep self-binders clear of the pieces of stalk and other excess that fell when the grain was elevated towards the binder.⁸⁰⁴ Knopf also offered his opinions on the design of McCormick’s machines based on the “book” he was given as an agent, and continued to correspond

⁷⁹⁹ George L. Roby to M.H.M.C. July 14, 1884. C.H.M. Correspondence, Box 96.

⁸⁰⁰ P. A. Spicer to M.H.M.C. January 22, 1884. C.H.M. Correspondence, Box 96.

⁸⁰¹ D. M. Branham to M.H.M.C. May 1, 1883. C.H.M. Correspondence, Box 87.

⁸⁰² See O. B. Drury correspondence, C.H.M. Correspondence, Box 83, Box 88, Box 93, and Box 97.

⁸⁰³ W. R. Baker to Hanna. March 20, 1883. C.H.M. Correspondence, Box 87.

⁸⁰⁴ Josiah Knopf to M.H.M.C. April 11, 1882. C.H.M. Correspondence, Box 84; A. E. Mayer to M.H.M.C. March 23, 1882. C.H.M. Correspondence, Box 85.

with Mayer about his attachment.⁸⁰⁵ McCormick agents like Drury and Knopf used their machine knowledge to alter machines to the point that they claimed innovation, but, despite their positions within the company, had to approach it as outsiders and their claims to the production of mechanized agriculture were often no more heard than those of farmers.

Agents for McCormick's competitors also wrote to offer their ideas. Robert H. Kerr, for instance, wrote, "I have been selling mowers and reapers more or less for ten years past and claim to have some practical knowledge of making them." He wanted to gauge McCormick's interest in his cutting apparatus and pitman and also asked for an agency with the McCormick company.⁸⁰⁶ A couple agents for McCormick's biggest competitor, Deering, offered their machines and attachments to McCormick as well, though the notes from Baker seem to indicate a lack of interest from the McCormick company.⁸⁰⁷ The agents who offered their improvements to the machines they sold and maintained were not limited to the harvester industry. Harriet Connor Brown recalled that one of her sons invented a ruffler attachment for a sewing machine while working as an agent for that company. Brown claimed that her sons got some of their prowess in tinkering from her, as she also had a knack for the mechanical: "Long before I saw an egg beater in a store, I made one for myself."⁸⁰⁸ Her son, Will, took that practice of tinkering

⁸⁰⁵ Josiah Knopf to M.H.M.C. April 11, 1882. C.H.M. Correspondence, Box 84; Josiah Knopf to A. E. Mayer. August 16, 1882. C.H.M. Correspondence, Box 85.

⁸⁰⁶ Robert H. Kerr to A. E. Mayer. January 8, 1884. C.H.M. Correspondence, Box 94.

⁸⁰⁷ William H. Osmer to McCormick. March 14, 1882. C.H.M. Correspondence, Box 85; George W. Kellogg to M.H.M.C. April 18, 1884. C.H.M. Correspondence, Box 94.

⁸⁰⁸ Brown, *Grandmother Brown's One Hundred Years*, 134-135.

into his job as a machine agent. Nevertheless, the attempted innovation from company agents demonstrates that the repair and maintenance work they did could cross over into alteration and improvement.

Prospective inventors could also appeal to the patent office to bolster their claims to the production of mechanized agriculture. Not all writers had patents for their proposed devices. D. H. Churchill, for instance, wrote that he did not have a patent, but planned to get one soon.⁸⁰⁹ Others did have a patent and gave their patent information to McCormick, including the patent numbers or dates issued.⁸¹⁰ William Stephens even enclosed the entire patent in his letter to the company for their review.⁸¹¹ The Brassie brothers must have done the same, as Baker noted that he received their patent and mailed it back to them on top of their letter.⁸¹² Others could not share this information because they had applied for a patent, but had not yet received it.⁸¹³

If one did choose to pursue a patent, they might consult with another form of professional in patent agents. Patent agents acted as facilitators between companies and inventors, as professionals like Colahan did, but could be employed by the patent sellers rather than the buyers. Patent agents advertised their services to farmers in newspapers like the *Prairie Farmer*, alongside articles that gave advice on how to obtain patents in

⁸⁰⁹ D. H. Churchill to McCormick. January 12, 1883. C.H.M. Correspondence, Box 88.

⁸¹⁰ Leonhardt Hoffman to Cyrus Hall McCormick and Leander J. McCormick. March 8, 1883. C.H.M. Correspondence, Box 88.

⁸¹¹ William Stephens to M.H.M.C. 1885. C.H.M. Correspondence, Box 101.

⁸¹² Brassie Brothers to M.H.M.C. October 20, 1882. C.H.M. Correspondence, Box 83.

⁸¹³ Samuel Olson to McCormick and Company. June 2, 1885. C.H.M. Correspondence, Box 100; J. H. Rose to M.H.M.C. May 27, 1885. C.H.M. Correspondence, Box 100; S. B. Robbins to McCormicks. December 30, 1882. C.H.M. Correspondence, Box 86; A. B. Allen to M.H.M.C. C.H.M. Correspondence, Box 92.

the first place.⁸¹⁴ Patent lawyers were also involved in the correspondence between the McCormick company and prospective inventors. Some writers hired patent lawyers to assist them in their efforts to sell or otherwise profit from their inventions.⁸¹⁵ One even wrote with the letterhead of the firm of his patent lawyer.⁸¹⁶ Patent lawyers could also buy patents for their own name in an attempt to then sell them on, as R. M. Hunter, a “solicitor of American and foreign patents,” did in 1883, offering McCormick a patent for \$25,000. Hunter also included a piece of twine tied by his knoter in the letter he sent as a physical demonstration.

Yet there was still distrust among farmers for patent lawyers and agents as members of the non-producing classes. An 1860 article complained that large companies “by the aid of your technical gentlemen, patent lawyers and patent agents, something is devised, differing slightly from other things, merely that money be made by the sale of the rights.”⁸¹⁷ Farmers also particularly worried about these patent peddlers when it came to buying—rather than selling—patents, as some patent agents went door-to-door, not unlike machine company agents, with nothing but ideas to sell. *Prairie Farmer* contributor, L.P. Cummins encouraged farmers to stay away from the schemes of these salesmen. If farmers wanted to be involved in the business of technology, Cummins recommended they become an agent for an existing company, rather than try to buy up

⁸¹⁴ “Patent Agency.” *Prairie Farmer*, June 1, 1872, 172; “Obtaining Patents.” *Prairie Farmer*, February 7, 1885, 83. For other newspaper articles offering advice on what constituted a patentable invention and how to seek patents, see, “What Constitutes a Patentable Invention.” *Grange Advance*, January 21, 1874, 6.

⁸¹⁵ Henry Milleran to M.H.M.C. October 12, 1882. C.H.M. Correspondence, Box 85.

⁸¹⁶ M. M. Hooton to Paul Arnold. November 28, 1884. C.H.M. Correspondence, Box 93.

⁸¹⁷ “Inventors and Inventions.” *Prairie Farmer*, May 24, 1860, 244.

new and untried patents.⁸¹⁸ Another article gave a cautionary tale of a farmer who became “A Victim of Patents” by buying too many useless ones while a further article on “Patents and Patent Swindlers” made the comparison of patent sellers to peddlers of humbug even more apparent.⁸¹⁹ One writer worried about the trustworthiness of the patent lawyer he had hired and wrote a letter to the McCormick company accusing them of working with his patent lawyer to defraud him.⁸²⁰ The producerist nature of farmers’ claims left many no more willing to work with patent lawyers than with company agents.

In asserting the importance of their own mechanical efforts in patents and appeals to McCormick, farmers engaged in the same conflict as the Grangers, albeit in a more individualized and likely less effective way. They asserted their contributions to the technological systems that made the mechanization of agriculture possible. Nevertheless, they were aware of the disparity of power between themselves and a company like McCormick when it came to shaping and collecting the bounty of systems of mechanized agriculture and thus approached McCormick in their efforts to shape and profit from those systems.

Working With McCormick

⁸¹⁸ “Farmers and Patent Rights.” *Prairie Farmer*, June 18, 1870, 185.

⁸¹⁹ “A Victim of Patents.” *Prairie Farmer*, September 10, 1870, 286; “Patents and Patent Swindlers.” *Prairie Farmer*, May 25, 1872, 161; See also, “Industry, Labor, Law, Legislation,” *Prairie Farmer*, July 5, 1879; “Patent Rights – Farmers, Beware.” *Farmers’ Union*, October 13, 1873, 333.

⁸²⁰ Conrad Lohan to M.H.M.C. August 15, 1884. C.H.M. Correspondence, Box 94.

There were a number of reasons that the writers of these letters gave for reaching out to the McCormick company in their efforts to develop, promote, or profit from their inventions. Most of these reasons had to do with the capital and skilled labor that McCormick was able to command. The company's power in the industry made it a place through which inventors endeavored to enter, shape, or profit from the industry. They continued to make claims based on the technological systems they had produced on the farm, even as they recognized the need to solicit the aid of those who controlled the production of the machines' components themselves.

Many prospective inventors wrote because they needed McCormick's help to perfect their inventions. They envisioned some help to be financial. Baker complained about letter writers who sought nothing but a funding source for their experiments when he wrote, "it looks very much as though Mr. Hopkin had not faith enough in his invention to proceed and get a patent but wishes to get some one to milk the expenses." Baker went on to describe such a situation as "quite common."⁸²¹ Yet what looked to Baker like mooching was an acknowledgement from farmers that, in order to shape the direction of the harvesting machine industry in the 1880s—and thus also the direction of harvesting technology—one had to involve an institution like McCormick. C. D. Bowly, who had some help from a skilled ironworker in building a new reaper blade made of hard and soft metals, wrote, "I can invent but have not the money or the business tact to secure and sell my invention."⁸²² Others, like J. Heeren and Joseph Custer, had not yet even built their

⁸²¹ William R. Baker to Butler. October 1883. C.H.M. Correspondence, Box 87.

⁸²² C. D. Bowly to M.H.M.C. January 6, 1883. C.H.M. Correspondence, Box 87.

proposed devices because they “have not the means to get it made.”⁸²³ August Maurer, on the other hand, claimed his problem was not in building the machine, but in patenting it, as he was too poor to avoid the fees associated with the application.⁸²⁴ S. H. Raymond summed up this reason for writing to McCormick when he wrote, “you are rich and I am poor.”⁸²⁵ W. C. Preston also claimed poverty as a reason for needing McCormick’s help, but he also pointed to other limitations that prevented him from perfecting his machine, describing himself as having “auf one arm and not much brains” and “neither mechanical skill nor means to perfect a working model.”⁸²⁶

While many farmers possessed more mechanical skill than Preston, they did nonetheless seek help from skilled workers and experts employed in the industry. The McCormick company had many such men at its command in the 1880s. Some letter writers simply wanted advice on the feasibility and merits of their machines.⁸²⁷ W. H. Merdoch, for instance, wrote to Cyrus Hall McCormick about his friend’s machine based on “your ability to judge the value of harvesting machinery.”⁸²⁸ Others asked for help in testing the machine and patenting it.⁸²⁹ Still others wanted expert help in building the

⁸²³ J. Heeren to McCormick. January 6, 1883. C.H.M. Correspondence, Box 88; Joseph Custer to M.H.M.C. June 17, 1884. C.H.M. Correspondence, Box 93.

⁸²⁴ August Maurer to M.H.M.C. January 1, 1885. C.H.M. Correspondence, Box 99.

⁸²⁵ S. H. Raymond to M.H.M.C. July 26, 1884. C.H.M. Correspondence, Box 95.

⁸²⁶ W. C. Preston to Cyrus Hall McCormick and Leander J. McCormick. January 31, 1882. C.H.M. Correspondence, Box 86.

⁸²⁷ Earl G Watrous to M.H.M.C. June 29, 1885. C.H.M. Correspondence, Box 101; Jas J. Watson to M.H.M.C. September 4, 1885. C.H.M. Correspondence, Box 101; Alex McCall to M.H.M.C. September 15, 1882. C.H.M. Correspondence, Box 85.

⁸²⁸ W. H. Merdoch to Cyrus Hall McCormick. June 20, 1882. C.H.M. Correspondence, Box 85.

⁸²⁹ Loren D. Hast to Cyrus Hall McCormick. December 12, 1882. C.H.M. Correspondence, Box 84.

machine and perfecting its materials.⁸³⁰ This expert help—from both the growing group of official experts hired by McCormick and from skilled foundry workers and machinists at the factory in Chicago—could make a substantial difference. Someone scribbled a note on a letter from Alvin O. Carman about his experience seeing Carman’s machine at a fair in Lansing, Michigan: “it was very poorly built, and of course in his hands is a failure, but he has a good principle and I believe if you had it in your hands you could improve on it and make it a success.”⁸³¹ O. B. Drury, a McCormick agent, also sought help in turning his design of an improved pitman into a reality, despite the fact that, as he insisted, “I am not a mechanic.”⁸³² As R. H. Adair complained that the company’s command of skilled labor allowed them to supersede any improvements “by superior workmanship” many wrote to McCormick hoping to enlist some of that superior workmanship to perfect their machines.⁸³³ There were, however, also local sources from which farming people might have gotten some help in constructing their machines. Ben Craycroft reported that a young man named Oliver had some help from a local blacksmith in building his machine.⁸³⁴ Yet, in the 1880s, companies like McCormick commanded the human and material capital required to shape harvesting machines. Farmer-inventors acknowledged that they had to work with and not against McCormick in order to secure skilled factory and foundry labor.

⁸³⁰ J. H. O’hara to McCormicks. April 21, 1885. C.H.M. Correspondence, Box 100.

⁸³¹ Alvin O. Carman to M.H.M.C. June 19, 1885. C.H.M. Correspondence, Box 97.

⁸³² O. B. to M.H.M.C. July 3, 1883. C.H.M. Correspondence, Box 83.

⁸³³ R. H. Adair to M.H.M.C. March 18, 1885. C.H.M. Correspondence, Box 96.

⁸³⁴ Ben Craycroft to M.H.M.C. March 28, 1884. C.H.M. Correspondence, Box 93.

Letter writers also sought to profit from their contributions to the mechanization of agriculture. Some sought to enter into arrangements with the company by which it would grant them royalties for the use of their inventions on its machines.⁸³⁵ One proposed selling “stocks” of his machine, though it is unclear if he meant to assign a portion of his patent or to find investors to go into business.⁸³⁶ Others sought to simply sell their ideas, patents, or rights outright. C. C. Eaton, for instance, offered his twine binder and shocker for \$10,000.⁸³⁷ W. A. Keller made a similarly ambitious offer to sell for \$1,000 immediately, and another \$9,000 should the use of his device prove satisfactory in the coming harvest.⁸³⁸ The company does not seem to have accepted such offers, though it did buy patents from all over the country for much smaller sums, including the \$200 that Colahan spent on a patent in Pennsylvania that he claimed was worth \$10,000.⁸³⁹ William H. Gifford’s less specific declaration to “sell to the highest offer” may have resulted in a similar payment.⁸⁴⁰

Some attempted to navigate the business world of the harvester industry. They strategically let the company know that they were either soliciting, or had already received interest from, other companies. John W. Hull wrote, “I intend to call the attention of reaper parties at once,” to his efforts, while D. Shields reported that the

⁸³⁵ Waters and Earnest to M.H.M.C. December 23, 1880. C.H.M. Correspondence, Box 78; B. L. Stewart. February 18, 1882. C.H.M. Correspondence, Box 87; A. R. Heath. April 10, 1883. C.H.M. Correspondence, Box 88.

⁸³⁶ J. W. Gordon to M.H.M.C. January 9, 1883. C.H.M. Correspondence, Box 88.

⁸³⁷ C. C. Eaton to McCormick Reaper Co. December 11, 1882. C.H.M. Correspondence, Box 83.

⁸³⁸ W. A. Keller to Charles C. Colahan. January 10, 1882. C.H.M. Correspondence, Box 84.

⁸³⁹ Charles C. Colahan to Cyrus Hall McCormick. October 11, 1875. C.H.M. Correspondence, Box 57.

⁸⁴⁰ William H. Gifford to M.H.M.C. September 18, 1884.

Deering company, specifically, was already interested in his.⁸⁴¹ J. P. Monroe claimed to already be working with the Marshes, but nonetheless wanted to ask about McCormick's interest.⁸⁴² On the other hand, competing firms and letter writers could collaborate. J. Louis Nollen, for instance, told Cyrus Hall McCormick Jr. that he was an expert for a competing reaper manufacturer who actually recommended he reach out to McCormick because his device might work best on their machine.⁸⁴³ Although not often successful, these inventors attempted to manipulate McCormick by market interests in order to make their own claims to the production of mechanized agriculture.

Farmers and other prospective inventors sought the aid of a firm at the top of the farm machine industry. They were aware of the power disparity between themselves and a manufacturer like McCormick in shaping and profiting from the technological systems of industrial agriculture. They therefore navigated that power disparity in order to claim distinct and individualized ownership of their inventions as a small part of the production of mechanized agriculture.

Attempting to Shape Technological Trajectories

⁸⁴¹ John W. Hull to M.H.M.C. August 1, 1882. C.H.M. Correspondence, Box 84; D. Shields to M.H.M.C. October 27, 1885. C.H.M. Correspondence, Box 101. See also, Josiah Lucas to Cyrus Hall McCormick. February 6, 1885. C.H.M. Correspondence, Box 99.

⁸⁴² J. P. Monroe to Cyrus Hall McCormick. 1882. C.H.M. Correspondence, Box 85.

⁸⁴³ J. Louis Nollen to Cyrus Hall McCormick Jr. C.H.M. Correspondence, Box 95.

Farmer-inventors actively sought to shape the technological trajectory of the farm machine industry and thus also the trajectory of broader technological systems of industrial agriculture. They sought not only profit from their inventions, but also pursued particular types of inventions and technological paths that fit well within the technological systems they currently understood. Doing so was an attempted assertion of control over those systems. Yet they were also aware that the technological trajectory of the industry was shaped by developments within companies like McCormick and thus adapted to the increased complexity of machines in their attempts to claim improvements.

Many writers made attachments to machines, often claiming that their attachment worked well with the increasingly complex technical components of each McCormick machine. Some, like William N. Bennett, claimed that their devices “could be worked anywhere or on any machine.”⁸⁴⁴ Others were a bit more specific, but still made broad claims about compatibility. George T. and Daniel Murray claimed that their “improvement can be attached to any harvester reel in use without changing its construction in any respect.”⁸⁴⁵ Lee Rude claimed that his “can be attached to any binder.”⁸⁴⁶ John J. Hoke claimed to have installed his device on seven McCormick machines in addition to other types of machines.⁸⁴⁷ As many machines became increasingly complex, prospective inventors had to deal with that complexity. Writers also asserted the compatibility of their devices with McCormick machines, specifically.

⁸⁴⁴ William N. Bennett to McCormick. 1885. C.H.M. Correspondence, Box 97.

⁸⁴⁵ George T. Murray and Daniel Murray. McCormick. April 30, 1885. C.H.M. Correspondence, Box 100.

⁸⁴⁶ Lee Rude to M.H.M.C. March 3, 1885. C.H.M. Correspondence, Box 101.

⁸⁴⁷ John J. Hoke to M.H.M.C. July 17, 1883. C.H.M. Correspondence, Box 88.

August Maurer and Dewitt Ellsworth, who both claimed mower improvements, asserted that the McCormick mower would not have to be substantially changed to put their device on. Ellsworth even claimed that his cutter bar improvement could be swapped with the original in less than a minute.⁸⁴⁸ In doing so, they acknowledged that the mechanical components of particular machines, and of McCormick's production processes, were central to the determination of the technological trajectory of the industry.

Compatibility between machines was an important consideration. O. B. Drury was not initially familiar with McCormick machines, but after serving as an agent for the company he claimed that his knowledge of the machines allowed him to make his mower pitman compatible.⁸⁴⁹ H. S. Folger, another inventor of a pitman, wanted help from the company in making his device compatible with McCormick machines and asked to be furnished with a McCormick pitman for comparison.⁸⁵⁰ D. F. Oliver knew his pitman would actually be more compatible with the mowers of the Empire or Woods companies, as these also used a "crank pitman" system, but he offered it to McCormick nonetheless.⁸⁵¹ Machine compatibility was something that all prospective inventors had

⁸⁴⁸ August Maurer to M.H.M.C. January 1, 1885. C.H.M. Correspondence, Box 99; Dewitt Ellsworth to Cyrus Hall McCormick. December 9, 1884. C.H.M. Correspondence, Box 93.

⁸⁴⁹ O. B. Drury to M.H.M.C. June 12, 1882. C.H.M. Correspondence, Box 83; O. B. Drury to M.H.M.C. July 15, 1882. C.H.M. Correspondence, Box 83; O. B. Drury to M.H.M.C. July 20, 1882. C.H.M. Correspondence, Box 83.

⁸⁵⁰ H. S. Folger to M.H.M.C. March 9, 1882. C.H.M. Correspondence, Box 83.

⁸⁵¹ D. F. Oliver to Cyrus Hall McCormick and Leander J. McCormick. September 2, 1882. C.H.M. Correspondence, Box 85.

to contend with as they sought to shape the technological systems of industrial grain farming.

In no line of machine was inventors' concern for compatibility more apparent than in self-binding harvesters. These complex machines were originally designed as attachments for elevated harvesters, but the inventors of new attachments had to make them work with different base machines. Josiah Lucas assured the men reading his letter that his cord holder for self-binding harvesters would fit with the McCormick binder's system of motion, and that there would be "no change in position" and nothing to interfere with "any other moveable part."⁸⁵² Dawe Hay made similar claims about his platform for a "low-down" binder that would be compatible with the knotting devices invented by J. F. Appleby, who worked at various times with both the McCormick and Deering companies.⁸⁵³

On the other hand, some farmer-inventors attempted to re-direct technological development into something more compatible with their own machine experience. Their many attempts to build a "low-down" binder illustrate the efforts of farmers to reshape the industry. A "low-down" binder consisted of a self-binding attachment fixed to a regular reaper, in the same line of development as the McCormick reapers that had populated Midwestern farms since the late 1840s. Most self-binders, however, were built to be attached to harvesters closer to the system of the Marsh harvester, which elevated grain up from where it was cut onto a platform. From there, the binding attachment could

⁸⁵² Josiah Lucas to Cyrus Hall McCormick. February 6, 1885. C.H.M. Correspondence, Box 99.

⁸⁵³ Dawe Hay to M.H.M.C. January 18, 1882. C.H.M. Correspondence, Box 84.

do its work. Yet farmers had decades more experience using and maintaining reapers than they did larger, and more expensive, harvesters. They thus sought to attach the binding mechanisms which worked so well on elevated harvesters onto their common, low-down reapers.

Inventors struggled to make their low-down reapers work effectively in their fields, but they continued to pursue this path of technological development. M. K. Skutt reported to McCormick that farmers told him they wanted a low-down binder, and not an elevated one, and that is why he tried to build one.⁸⁵⁴ Alvin O. Carman was another farmer who wrote to McCormick of his efforts to build a low-down binder as well. Even though he built a machine, it seems to have never performed quite as well as its elevated competitors.⁸⁵⁵ This was a common theme with efforts towards a low-down binder. J. P. Monroe and J. H. O'Hara also wrote of their efforts, and general lack of successes, building low-down binders.⁸⁵⁶ Despite setbacks, would-be inventors continued to strive for a low-down binder. Inventors of these machines also stressed their compatibility with the existing systems of its two major components: reapers and knotting mechanisms.⁸⁵⁷ William H. Payne apparently built one in 1885 and corresponded with the company about it over multiple years.⁸⁵⁸ While low-down binders never came into the same level of

⁸⁵⁴ M K. Skutt to C.H.M. November 2, 1884. C.H.M. Correspondence, Box 96.

⁸⁵⁵ Alvin O. Carman to McCormick and Co. April 7, 1885. C.H.M. Correspondence, Box 101.

⁸⁵⁶ J. P. Monroe to Cyrus Hall McCormick Jr. January 13, 1885. C.H.M. Correspondence, Box 101; J. H. O'hara. April 21, 1885. C.H.M. Correspondence, Box 100.

⁸⁵⁷ Charles Miller to M.H.M.C. September 17, 1885. C.H.M. Correspondence , Box 100; William Piatt to Cyrus Hall McCormick. July 15, 1885. C.H.M. Correspondence, Box 95.

⁸⁵⁸ William H. Payne to M.H.M.C. October 15, 1884. C.H.M. Correspondence, Box 95. William H. Payne to M.H.M.C. September 27, 1885. C.H.M. Correspondence, Box 100.

widespread use as elevated binders, and were likely less effective, the appeal of this untraveled road demonstrates the extent to which rural people strove to maintain their machine knowledge in a changing industry.

Farming people imagined new trajectories for technological systems and their components, as they sought machines that fit better with their own knowledges and practices, whether or not those were the machines that manufacturers were producing and pursuing. Nevertheless, their claims that their machines would be compatible with complicated existing machines like self-binding harvesters also demonstrates their acknowledgement that there were other forces shaping the technological trajectory of the industry.

Altering Machine Systems for Labor, Animal, and Crop Systems

Farming people also altered machines in order to shape them to better fit with their farm systems of labor organization, crop cultivation, and animal husbandry. In fact, it was often when farming people altered their machines to better fit with their labor, crop, and animal systems on the farm that they made their strongest claims to invention and improvement. Their imagination of a technological future, as well as their material ability to shape machines into that future, were conditioned by their relationships with farm systems.⁸⁵⁹ Their claims as producers of the technological systems of mechanized

⁸⁵⁹ For a theoretical discussion of the imagination of technological futures, see, Jasanoff, "Future Imperfect."

agriculture, as well as their claims to the invention of new devices and attachments, were strongest when rooted in the relationships between machines and farm systems.

Farming people worked to make machines more transportable, which also made them easier to fit into farm systems of labor organization. Yet binders, which were built on top of harvesters, were larger and heavier than reapers, and thus more difficult to transport. Several men wrote to the McCormick company about their invention of trucks for the transportation of binders.⁸⁶⁰ Tullie S. Scarff went so far as to assert that his neighbors all assured him they would never buy a binder without a truck, and also added that his would easily travel over bridges as well as fields.⁸⁶¹ The inventors of trucks for binders wrote to the McCormick company because they believed their inventions were a critical component of making the new McCormick machines compatible with the necessities of machine sharing, hiring, and transport, as well as the environmental features, like streams and the bridges over them, that shaped those necessities.

Many farmers' claims also addressed the intersection of machine systems with animal systems, particularly the use of horses as draft animals. Writers identified the strain put by machines on the horses as a problem that the heavier machines of the 1880s exacerbated. Many tinkers claimed the ability to relieve some of this weight from the horses.⁸⁶² One farmer observed that a new self-binding harvester "was all that three

⁸⁶⁰ Orin Simpson to Cyrus Hall McCormick. December 17, 1882. C.H.M. Correspondence, Box 86; James Archer to M.H.M.C. June 10, 1885. C.H.M. Correspondence, Box 99.

⁸⁶¹ Tullie S. Scarff to M.H.M.C. February 18, 1882. C.H.M. Correspondence, Box 86.

⁸⁶² See, for instance, F. C. Donaldson to M.H.M.C. April 28, 1883. C.H.M. Correspondence, Box 88; Frederick Laguna to M.H.M.C. November 1885. C.H.M. Correspondence, Box 99; John J. Hoke to M.H.M.C. July 17, 1883. C.H.M. Correspondence, Box 88.

horses wanted to pull” and offered an adjustment to the machines gearing that would make the gears run easier, with less force necessary from the horses.⁸⁶³ D. P. Kisner came up with another idea, derived from his own use of McCormick machines: “it occurred to me, while driving a cord binder last harvest, that there should be a support under the tongue to take the weight from the horses necks, while the driver was off his seat, oiling and putting in cord.”⁸⁶⁴ Kisner’s knowledge that the weight on the horses increased when the driver was not on the seat was derived directly from his experiences with both the machine and his horses. Henry Gaughagan came up with the idea of a wheel attached to the front of the machine to take some of the weight off the horses’ necks as well.⁸⁶⁵ Some plans for making machines more compatible with horses were about reducing “side draft”—the disproportionate weight of the machine on one side of the horses. Equalizers were intended to solve this problem and distribute the weight evenly, and farming people were most predominately represented among patentees and letter writers for these devices.

⁸⁶³ Frank M. Brauer to Cyrus Hall McCormick Jr. July 12, 1884. C.H.M. Correspondence, Box 92.

⁸⁶⁴ D. P. Kisner to Cyrus Hall McCormick. March 10, 1884. C.H.M. Correspondence, Box 94.

⁸⁶⁵ Henry Gaughagan to M.H.M.C. November 27, 1885. C.H.M. Correspondence, Box 98.

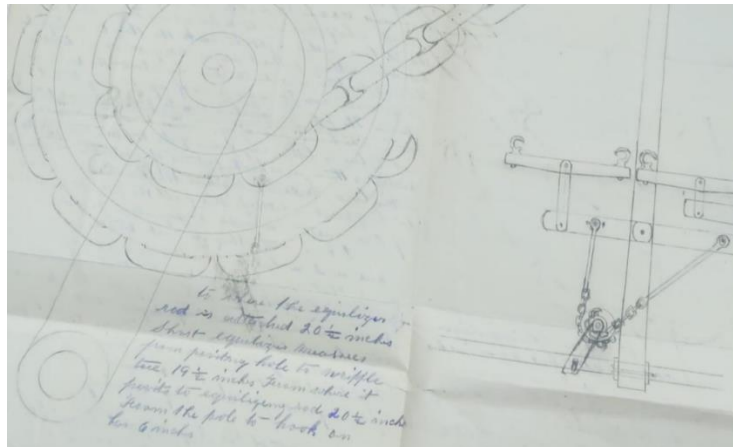


Figure 15: Pictured above is a design from the Canadian inventor of a horse-equalizer. These devices balanced the weight of the machine as the horses pulled it and thus negotiated the relationship between the machine and the animal systems it interacted with. Josiah Lucas to Cyrus Hall McCormick. February 6, 1885. C.H.M. Correspondence, Box 99.

Some of those farmers who wrote to the McCormick company about their equalizers clearly demonstrated the relationship between their knowledge of animal systems and the machine systems of McCormick's products. One way they did so was in the opinions they expressed about McCormick's "three-horse" equalizer that came with his machines in the 1880s. The McCormick company made their equalizer for three horses, but farmer-inventors like E. E. Stevenson were adamant teams composed of an odd number of horses would cause weight distribution problems.⁸⁶⁶ Several farmers thus encouraged McCormick to switch to a four-horse design, according to their own described plan, of course. James Wolfe assured McCormick that a four-horse equalizer would sell better than the three horse one his machines came with. William Lewis, of

⁸⁶⁶ E. E. Stevenson to M.H.M.C. October 20, 1885. C.H.M. Correspondence, Box 91.

Sauk Centre, Minnesota, identified a disconnect between the machine industry men in Chicago and the needs of farmers:

I know that it is a matter of pride with all manufacturers to suppose that three horses are sufficient to draw their binders but actual experience does not sustain them in this as witness I have only been over part of this and part of two adjoining towns to sell and put on these fifty attachments and after harvest I expect to have plenty of testimonials to prove that I am right.⁸⁶⁷

Even as farmer-inventors of equalizers asserted the need for systems compatibility with animals, they also recognized the need to make their machine alterations compatible with manufactured machines. Equalizer inventor, John H. Ingersoll, assured that his new equalizer was perfectly compatible with McCormick harvesters, and had been tested on several of them already.⁸⁶⁸ Farmer-tinkerers took particular command of the intersections between their animal and machine systems, but they knew that they had to do so in ways that worked with the machine systems. In the 1880s, however, the complications of new machines like self-binding harvesters would continue to make it more difficult for farmers to assert agency over the technological systems of mechanized agriculture.

Some tinkerers proposed other accommodations between machines and horses. Several wrote of their plans to change other components of the machines in order to eliminate side-draft.⁸⁶⁹ Other horse problems with solutions to be found were less about the weight and distribution of draft, and more about the management of the horses. One

⁸⁶⁷ William Lewis to M.H.M.C. July 2, 1886. C.H.M. Correspondence, Box 83.

⁸⁶⁸ John H. Ingersoll to M.H.M.C. August 27, 1885. C.H.M. Correspondence, Box 98.

⁸⁶⁹ Frank Winston to McCormick and Co. July 10, 1885. C.H.M. Correspondence, Box 101; John H Neperud to Cyrus Hall McCormick and Leander J. McCormick. April 12, 1882. C.H.M. Correspondence, Box 101; John R. Stormont to M.H.M.C. September 2, 1882. C.H.M. Correspondence, Box 87; O. A. Gadeke to Cyrus Hall McCormick. February 23, 1883. C.H.M. Correspondence, Box 88.

letter offered a “horse detacher” that would allow a machine operator to quickly remove himself and the machine from the horses in the case of “runaways.”⁸⁷⁰ Another offered a detachable horseshoe, or “a shoe without nails.” Correspondence about this novel replacement for the nailed-in horseshoe shows just how connected the worlds of harvesting machinery and draft animals like horses were in the minds of farmers.⁸⁷¹

Letter writers also claimed specific adaptations to the types or conditions of crops and fields and thus made their claims to invention of the basis of their production of machine and environmental systems together. Many farmers may have agreed with P. A. Spicer, an implement dealer, when he wrote, “I have some experience cutting grain and know what I am talking about.”⁸⁷² They sought to apply their knowledge of their crop systems to their adaptations of machines. Several, like Frank M. Brauer, presented plans to prevent machines from getting “stalled” or “choking” in heavy grain. For Brauer, this problem also appeared related to the size and weight of new machines, which he described as “heavy running.”⁸⁷³ The specific problem of “lodged” grain—that had been bent over by wind or rain—remained a problem for machines as well. Alvin O. Carman claimed to have created a mechanical solution for that problem that would “straighten the

⁸⁷⁰ Barrett and Shower to M.H.M.C. 1883. C.H.M. Correspondence, Box 87.

⁸⁷¹ R. S. Bitser to McCormick. June 28, 1885. C.H.M. Correspondence, Box 97.

⁸⁷² P. A. Spicer to M.H.M.C. October 14, 1885. C.H.M. Correspondence, Box 101.

⁸⁷³ Frank M. Brauer to Cyrus Hall McCormick Jr. July 12, 1884. C.H.M. Correspondence, Box 92. See also, T. G. Coghill to M.H.M.C. March 18, 1885. C.H.M. Correspondence, Box 97; J. R. Jackson to Cyrus Hall McCormick. August 18, 1884. C.H.M. Correspondence, Box 93.

grain with the reel before cutting.” Farming people endeavored to make machines work better with their crops.⁸⁷⁴

Machine company sometimes privileged other considerations when addressing the compatibility of new devices. For instance, the compatibility of new devices with the patents a company already controlled was central to their profit-seeking strategies. Cyrus Hall McCormick Jr. noted of Carman’s solution to the lodged grain problem that he believed Carman’s device was the equivalent of something they already had.⁸⁷⁵ While farmers sought to make machines work with their fields, McCormick preferred improvements based on its own patents.

The straw binder was another machine that many sought to build, but that never quite came to fruition, also demonstrates farming peoples’ search for machine-crop compatibility. In 1887, a short statement in the *Prairie Farmer* declared that Walter A. Wood patented a straw binder.⁸⁷⁶ This machine would use straw, rather than cord or twine, to bind the wheat cut by a harvester. This would have meant a lot to farmers, who had to buy cord or twine, but who had an abundance of straw. Just as twine had replaced cord after cord-bound bundles of grain proved damaging to threshing machines, some hoped that straw would quickly replace twine. Several individuals offered their ideas, designs, and models to the McCormick company in the pursuit of a straw binder in the

⁸⁷⁴ Alvin O. Carman to Cyrus Hall McCormick. November 30, 1882. C.H.M. Correspondence, Box 83.

⁸⁷⁵ Alvin O. Carman to Cyrus Hall McCormick. November 30, 1882. C.H.M. Correspondence, Box 83.

⁸⁷⁶ “Straw-Binder.” *Prairie Farmer*, November 12, 1887, 727.

early 1880s.⁸⁷⁷ S. B. Tinkham made his a low-down version of a straw binder and attached it to a Champion reaper.⁸⁷⁸ John Boyd went a step further and claimed an idea to build a binder that bound with the grain stalks it cut as it went along, though this idea seems never to have come to fruition.⁸⁷⁹ While straw binders, like low-down reapers before them, were never successful enough to surpass twine binders, the efforts of farmers to build them demonstrated the extent to which their claims were strongest on the terrain of making machines work with farm systems like their crops. Farming people sought to turn automatic binders into something more compatible with their crop systems as well as with their social and animal systems.

Rural people's machine knowledges and practices were deeply connected to their knowledges and practices of the rest of farm life, and they altered machines to protect that connection. Their imagination of new technology and their ability to shape technologies to fit that vision were informed by their relationships not only with machines, but also by their relationships with the social and environmental systems in which they lived and worked. As they claimed invention, and thus also made claims to the production of mechanized farming more broadly, they did so based on their ability to make machines work with their own farm systems.

⁸⁷⁷ H. M. Grader to M.H.M.C. September 16, 1882. C.H.M. Correspondence, Box 84; E. D. Philips to Cyrus Hall McCormick. February 3, 1882. C.H.M. Correspondence, Box 86; Charles E. Donnellan to Cyrus Hall McCormick. January 31, 1883. C.H.M. Correspondence, Box 88; James Foran to M.H.M.C. May 11, 1884. C.H.M. Correspondence, Box 93.

⁸⁷⁸ S. B. Tinkham to Cyrus Hall McCormick. August 25, 1882. C.H.M. Correspondence, Box 87.

⁸⁷⁹ John Boyd to M.H.M.C. February 12, 1883. C.H.M. Correspondence, Box 87.

Making Maintainable Machines

Practices of machine maintenance also informed farming people's attempts to shape technological trajectories through their tinkering. Over decades, farming people had built maintenance practices, but now those practices conditioned the ways in which they thought about what machines should be and how they should operate. They thus set out to shape the technological trajectory of the industry in a direction more compatible with their own maintenance practices. Those attempts, and the alterations and improvements they made to facilitate maintenance, were a part of their production of technological systems on the farm.

Farming people discovered problems in their machines that made their use difficult and cumbersome. They thus set out to improve machines in ways that blurred the line between repair and alteration. Sylvester E. Harlow may have done his tinkering as “a great amusement to my idle hours” and farmers might have tinkered as a leisure activity as well, but many alterations were made out of the necessity of work.⁸⁸⁰ Farming people discovered problems as they attempted to make machines work in their fields, and they altered them to make them work better. David B. Ott, a storekeeper, described the tinkering of a local farmer who “by making his wings strike the grain at the right hand end of the platform first dropping the opposite end of [the] wing back to next arm so [the] reel was [the] shape of [a] propeller screw” simply because the farmer was annoyed about

⁸⁸⁰ Sylvester E. Harlow to Cyrus Hall McCormick. June 29, 1882. C.H.M. Correspondence, Box 84.

the cut grain “being carried to the binder head foremost.” The farmer thus altered the machine to his liking.⁸⁸¹ Another wrote to McCormick about a nut-bolt problem and a solution he had discovered “by experience with them.”⁸⁸² By both repairing and deliberately reshaping their machines, farmers produced maintainable machines.

As a relatively new technology in the 1880s, self-binders were the subject of a lot of farmer consternation and effort to make work correctly upon initial use. Cosmo M. Jones began using binders in 1882 and, after only one season’s worth of experience with them, wrote to McCormick to suggest an improvement.⁸⁸³ Jones Pearl was a farmer’s son whose father began using a self-binder and noted, “for about one month after they bought it I studied the binder.” He also wrote to the company about his own design for a knotter.⁸⁸⁴ Miles G Hamilton noticed a problem with his self-binder and built a “spring attachment to your binding arrangement,” with which he claimed to have “completely overcome” the trouble.⁸⁸⁵ William Kuhl decided to address the problem of twine breaking when running through the McCormick binder.⁸⁸⁶ These and others who turned their attention to binders were a part of the process of taking the machine delivered from the factory, and turning into something that worked on the farm.⁸⁸⁷

⁸⁸¹ David B. Ott to Cyrus Hall McCormick. May 12, 1882. C.H.M. Correspondence, Box 85.

⁸⁸² A. A. Kelly to M.H.M.C. May 6, 1885. C.H.M. Correspondence, Box 99.

⁸⁸³ Cosmo M. Jones to Cyrus Hall McCormick. November 3, 1882. C.H.M. Correspondence, Box 84.

⁸⁸⁴ Jones Pearl to M.H.M.C. December 27, 1882. C.H.M. Correspondence, Box 84.

⁸⁸⁵ Miles G. Hamilton to McCormick and Son. June 23, 1882. C.H.M. Correspondence, Box 84

⁸⁸⁶ William Kuhl to Cyrus Hall McCormick. May 4, 1884. C.H.M. Correspondence, Box 94.

⁸⁸⁷ See also, Walter F. Jenkins to M.H.M.C. May 16, 1882. C.H.M. Correspondence, Box 84; F. Hoffman to Cyrus Hall McCormick. August 8, 1882. C.H.M. Correspondence, Box 84; J. P. Locke to M.H.M.C. July 16, 1882. C.H.M. Correspondence, Box 85; D. P. Kisner to Cyrus Hall McCormick. March 10, 1884. C.H.M. Correspondence, Box 94.

Many tinkerers made sure to point out that they had already incorporated their devices into their usual practices of machine use and maintenance. D. F. Robbins wrote of using his equalizer on McCormick machines, and R. R. Richeson wrote of using his attachment on McCormick binders during multiple harvests.⁸⁸⁸ Nevertheless, they also had to make it known, as John Hull did, that, despite the specific contexts of their own machine-use practices, it would be easy for others to use their device or alteration as well.⁸⁸⁹

Farmers' practices of maintenance left them with the knowledge necessary for machine tinkering. P. A. Spicer made the connection between maintenance practices and alteration distinctly clear:

Having handled mowing and reaping machinery for the last 25 years and having to contend against imperfections in all especially self binders, [sic] last season I neglected my regular business long enough to put what I call a decided improvement in the manner of delivering the cut grain to the binding needle on a machine.⁸⁹⁰

He thus claimed that his knowledge of machines, and ability to alter them, came largely from maintenance.

Some of the claims that letter writers made about their improvements were designed to augment, or make easier, farming people's usual maintenance practices.

⁸⁸⁸ D. F. Robbins to M.H.M.C. February 15, 1884. C.H.M. Correspondence, Box 95; R. R. Richeson to M.H.M.C. January 2nd, 1882. C.H.M. Correspondence, Box 86; See also, F. H. Borgen to M.H.M.C. October 2, 1882. C.H.M. Correspondence, Box 83; George W. Clark to M.H.M.C. October 11, 1883. C.H.M. Correspondence, Box 88; J. G. Leonard to M.H.M.C. May 12, 1884. C.H.M. Correspondence, Box 94.

⁸⁸⁹ John Hull to M.H.M.C. January 16, 1883. C.H.M. Correspondence, Box 89.

⁸⁹⁰ P. A. Spicer to M.H.M.C. January 22, 1884. C.H.M. Correspondence, Box 96.

Writers purported their improvements to augment maintenance simply by preventing the motions and accidents that machines allowed to happen in their current configurations. J. R. Jordan, for instance, wrote, “the little devise [sic], is intended to keep the sickle bar from wareing [sic] the finger and can be replaced easily.”⁸⁹¹ He thus claimed that his device lent itself easily to maintenance while ameliorating the need for maintenance on the sickle bar. Fred S. Gable similarly claimed that his new pattern of motion for the sickle bar would allow it to go longer without repair.⁸⁹² A. Gump devised a method of elevating grain that did not involve elevating the grain over the driving wheel as the usual method on McCormick machines did. It seems Gump that had experiences with grain and stalk getting stuck in the driving wheel after the machine elevated the stalk over the wheel.⁸⁹³ His proposed improvement would have prevented a potential source of breakage.

⁸⁹¹ J. R. Jordan to Cyrus Hall McCormick. November 27, 1884. C.H.M. Correspondence, Box 93.

⁸⁹² Fred S. Gable to Cyrus Hall McCormick. June 14, 1884. C.H.M. Correspondence, Box 93.

⁸⁹³ A. Gump to M.H.M.C. March 30, 1883. C.H.M. Correspondence, Box 83.

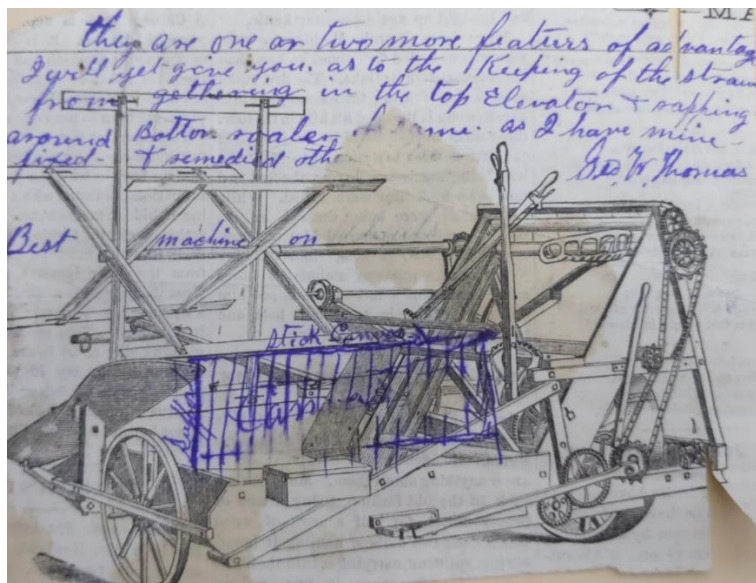


Figure 16: George W. Thomas, a farmer from Reno, County, Kansas, drew what he referred to as “a few awkward marks” on top of a picture of a McCormick self-binder taken from advertising or trade literature. Thomas’ proposed improvement would, like many of those proposed, build upon an existing machine that McCormick sold, and that Thomas likely used in his fields. It consisted of a canvas intended to prevent cut grain from spilling loose and interfering with the internal movements of another part of the machine. George W. Thomas to Cyrus Hall McCormick. February 20, 1882. C.H.M. Correspondence, Box 87; “George Thomas,” Loda Township, Reno County, Kansas. United States Federal Census, 1880. Ancestry.com.

Other claims to augment maintenance asserted the simplicity and durability of their designs as a strategy through which excess maintenance costs and concerns could be avoided. O. P. Stone referred to his devise as “simple and durable.”⁸⁹⁴ George P. Davis followed up with McCormick after revising his design to make it simpler than the last time he wrote to the company.⁸⁹⁵ Others identified driving chains and gearings as problematic pieces of machinery for farmers, perhaps due to their lack of familiarity with those mechanical systems compared to the simpler systems of earlier machines. L. W.

⁸⁹⁴ O. P. Stone to M.H.M.C. October 14, 1885. C.H.M. Correspondence, Box 101.

⁸⁹⁵ George P. Davis to M.H.M.C. September 25, 1883. C.H.M. Correspondence, Box 88.

Noyes asserted that his machine was desirable for its, “extreme compactness and the absence of driving chains.”⁸⁹⁶ John Cramer furthered this point in writing that “farmers tell me they want a machine that has the least gearing.”⁸⁹⁷ Some farmers attempted to build machines that could accomplish the same functions without the gears and chains that complicated their maintenance and practices. Nevertheless, the trajectory of the industry continued to lead in the opposite direction as machines would become more complicated.

Writers also offered improvements for machine repair tools, themselves a key component of mechanized agriculture. E. L. Miller, for instance, invented a sickle that he claimed could be more easily replaced than others.⁸⁹⁸ Others invented tools for the purposes of machine maintenance. Zarda Frost wrote of a “canvas buckler” that would repair the canvas used in the elevating parts of self-binders and harvesters.⁸⁹⁹ A. H. R. Blain claimed “an improvement in wrench especially designed for the use of reapers and mowers.”⁹⁰⁰ Chester Hodge invented a tool for adjusting binders so that they would tie bundles as tightly or loosely as the user wanted.⁹⁰¹ Tools and devices of machine repair emerged as a part of the farmer’s technological world, and farming people thus made claims about them as well.

⁸⁹⁶ L. W. Noyes to M.H.M.C. August 28, 1884. C.H.M. Correspondence, Box 95.

⁸⁹⁷ John Cramer to Cyrus Hall McCormick. March 15, 1884. C.H.M. Correspondence, Box 93.

⁸⁹⁸ E. L. Miller to Cyrus Hall McCormick. May 11, 1885. C.H.M. Correspondence, Box 101.

⁸⁹⁹ Zarda Frost to M.H.M.C. February 23, 1883. C.H.M. Correspondence, Box 88.

⁹⁰⁰ A. H. R. Blain to M.H.M.C. May 22, 1884. C.H.M. Correspondence, Box 92.

⁹⁰¹ Chester Hodge to M.H.M.C. April 1, 1884. C.H.M. Correspondence, Box 93.

Practices of machine maintenance had become so embedded among farming communities that many of their efforts to create or alter machines were themselves embedded in maintenance practices. As prospective inventors sought to make machines that were more maintainable or to make tools for the purposes of maintenance, they attempted to shape the technological trajectory of the industry in accordance with their prioritization of machine maintenance.

Communities of Adaptation

Some inventors of devices went beyond writing to the McCormick company about their new designs and actually put them into practice. While many of the farmer-inventors claimed to run their inventions on their own devices, some few claimed to also have begun making them for others in their community. They thus created a community of use in which machine alterations spread from one farmer to the next in what may have been localized cultures of machine use. These small, localized industries allowed farming people to alter their machines to the needs of their communities.

News of local improvements and adaptations could spread through farming communities by word of mouth, and, according to some inventors, led to farmers inquiring about their devices before the inventor had even had time to build more than one for anyone else in his community.⁹⁰² Some of these farmer-inventors then went on to

⁹⁰² Jacob Dunstedter to M.H.M.C. March 5, 1883. C.H.M. Correspondence, Box 88; George M. Kempf to M.H.M.C. April 28, 1885. C.H.M. Correspondence, Box 99.

set up operation as small-scale and informal manufacturers of their devices. John J. Hoke, for instance, claimed to have manufactured a number of his joint tongues for farmers in his area using different types of machines, including seven for McCormick harvesters.⁹⁰³

The makers of these adaptations and attachments took on the roles that manufacturers and their agents played in setting-up devices for farmers. William Lewis, for instance, claimed to have installed and set up his for-horse evener attachment on fifty machines in his area.⁹⁰⁴ He thus acted as an authority over technological change in the same way that McCormick's agents usually did.

It is likely that most localized communities of use of farmer-driven alterations were limited by the inability of the inventor to act as a manufacturer—an inability that Cyrus McCormick himself confronted in a different context in the late 1830s and early 1840s. Yet they nonetheless demonstrate the extent to which farming people drew their machine knowledge from, and contributed to the sustainment of, local communities as they produced the systems of mechanized agriculture in their own contexts.

Conclusion

Farming people expressed knowledge of, and concern for, their local systems of labor organization, crop cultivation, and animal husbandry as well as the internal mechanical systems of many machines. They made individual claims to the production of

⁹⁰³ John J. Hoke to M.H.M.C. July 17, 1883. C.H.M. Correspondence, Box 88.

⁹⁰⁴ William Lewis to M.H.M.C. July 2, 1886. C.H.M. Correspondence, Box 83.

mechanized agriculture through their improvements and inventions, even as they acknowledged the power disparity between themselves and manufacturers in shaping the trajectory of those technological systems. Farmer William D. Browning wrote to the McCormick company a few years before most of these individuals, in 1876, declaring, “The world should have the benefit of my mental cognition and inventions.”⁹⁰⁵ Most of the tinkerers who wrote to the McCormick company did not make quite so grandiose of claims, but their mental cognition and inventions did make the technological world of nineteenth-century farms function, and their claims to invention made their claims known.

⁹⁰⁵ William D. Browning to Cyrus Hall McCormick. September 15, 1876. C.H.M. Correspondence, Box 60.

Chapter Five

Parts, Populists, and Experts: New Machines and Maintenance Needs, 1875-1900

By the final quarter of the century, farm systems had become thoroughly populated with machines. Farmers continued to mechanize their operations in order to keep up with international competition and the falling price of wheat as augmented production outpaced demand—increasingly placing machines as the central and determining components of their technological systems of farming. They also came to rely on new types of machines that were larger, more expensive, and more complicated than their predecessors. These machines allowed farmers to wrest even more production out of the land, labor, and animals that compromised technological systems on the farm. Machines thus also came to the center of conflicts within farm families and communities and between farmers and machine manufacturers. Farming people continued to struggle for control over industrial agriculture as the maintainers of machines and producers of farm systems. Yet their claims to that status were undermined and limited by the increasing complexity of machines and by the efforts of machine companies and their agents to retain business control of the technologies of wheat farming.

The trajectory of technological change has often played a significant role in conflicts around the use of those technologies. As people enter into conflict around new technologies, they shape those technologies, and continued technological development also conditions the terrain on which those struggles continue. Hughes' concept of

“technological momentum,” illuminates these developments. Hughes argues that technological systems became both internally complex and socially embedded in the world around them, so much so that that they significantly conditioned the possibilities of both future technological and social developments.⁹⁰⁶ By the end of the nineteenth century, farm technological systems accrued momentum that brought their machine components closer to the center of those systems. The efficiency and expense of large machines ensured that farmers found themselves dependent on machine production and unable to produce without machines. Manufacturers thus ensured that the continued dominance of larger and more complicated machines gathered unstoppable momentum. Kevin L. Borg’s discussion of the ways that auto manufacturers’ use of electronic sensors changed how mechanics worked on cars and challenged their sociotechnical identities also demonstrates a parallel to the story of farm machine repair in the final decades of the century.⁹⁰⁷ As farmers confronted the necessity to use and maintain complex machinery, they accommodated the efforts of manufacturers to assert themselves and their agents as the authorities within farm technological systems in exchange for access to necessary expertise, and especially to necessary replacement parts.

Augmented Technological Systems for a Demanding Market

⁹⁰⁶ Hughes, “Technological Momentum.”

⁹⁰⁷ Borg, *Auto Mechanics*, 138-169.

As the difficulties of maintaining a farm after the Panic of 1873 made farmers more dependent on the production of wheat, they augmented their technological systems in order to produce enough to keep their operations afloat—even as such production only contributed to the precarities of fluctuating prices. The machines farmers turned to in the later nineteenth century were larger and more complex than those of the middle decades of the century. Often the western parts of the region were those in which the largest machines saw the most use as prairie farmers pursued mechanization to pay the costs of establishing frontier farms as well as to keep up with falling grain prices. Nevertheless, farmers throughout the Midwest and Ontario also pursued greater mechanization. Farming people pursued these systems in the context of changing economic conditions that drove them even further towards the maximization of wheat output and the transformation of their farms into outposts of industrial capitalism.

In the years after 1873, increased competition from a global wheat market, and a series of financial panics through the last three decades of the century, left wheat prices unstable. Yet farmers continued to have to grow as much wheat as possible in order to meet their fixed expenses like mortgages and machines debts. Machines themselves, however, were one way to augment production.⁹⁰⁸ Nebraska farm woman and Populist activist, Luna Kellie believed that her family's purchase of new farm machines, despite the difficulty of paying for them, was necessary to keep up with the demands of the market as they needed to make up for falling grain prices with larger field sizes.⁹⁰⁹

⁹⁰⁸ Levy, *Ages of American Capitalism: A History of the United States*, 249-254.

⁹⁰⁹ Kellie, *A Prairie Populist*, 83, 121.

Kellie's opinion that machines had become an essential part of farm operations, even if they contributed to overproduction and falling grain prices, was common by the end of the century. It was apparent to many farmers and to the agricultural press that farmers who relied exclusively on old hand methods could not compete with mechanized operations.⁹¹⁰ Increasingly, this meant not only the use of a reaper and mower, but also the use of larger harvesters and other machines like grain drills.

The field machines of grain cultivation that farmers turned to in the last quarter of the century were more complicated than those used in previous decades. Reapers and mowers now included new layers of gearing and attachments built on top of the designs of earlier decades.⁹¹¹ The 1870s saw the popular introduction of elevated harvesters, including the Marsh harvester and self-binding harvesters.⁹¹² New types of threshers, often named "separators" or "thresher-separators," also combined multiple aspects of the labor process and also made use of new attachments. Self-feeding attachments, for instance, mechanized the task of delivering the bundles of grain into the machine. Larger threshers often necessitated more horses to power them, and the use of steam-power also became more common.⁹¹³ There were also technological developments in grain drills. New types of press drills included components to bury planted seeds. These drills often

⁹¹⁰ "Machinery vs. Hand Labor." *The Rural Home* (Lawrence, Kansas), December 1899, Vol. 1, No. 10, 16; "Machinery Against Hand Labor." *Prairie Farmer*, April 29, 1899, 15.

⁹¹¹ "A Hundred Years Ago and Now," *Prairie Farmer*, April 29, 1876; Ardrey, 51-52.

⁹¹² Rogin, 107-119; Ardrey, 64-77.

⁹¹³ Rogin, 167-175; David Erb and Eldon Brumbaugh, *Full Steam Ahead: J.I. Case Tractors and Equipment, 1842-1955* (St. Joseph, MI: American Society of Agricultural Engineers, 1993), 31; See also, Wik, *Steam Power on the American Farm*,

began as attachments themselves for plows or came with their own attachments for placing fertilizers alongside seeds.⁹¹⁴

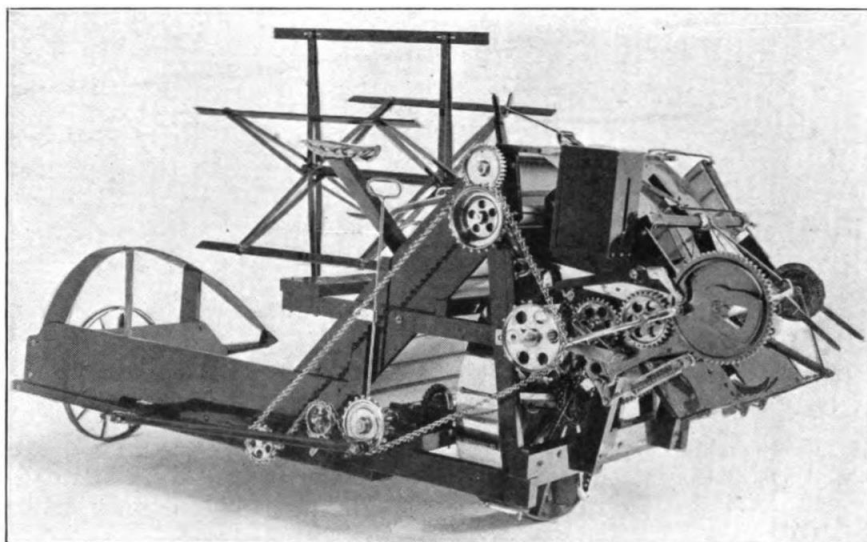


Figure 17: Display model of a Deering-Marsh Harvester and Twine Binder. Deering first put this machine on the market in 1879. Though it was not the first self-binder, it demonstrates the success of self-binding attachments added to elevated harvesters. Note also, the complicated gearing and greater proportion of metal components. “Official Retrospective Exhibition of the Development of Harvesting Machinery For the Paris Exposition of 1900” (Paris: Deering Harvester Company, 1900), 95.

⁹¹⁴ Ward, “Extensive Development of the Canadian Prairies,” 80-83; “Prairie City Broadcast Seeder.” *Prairie Farmer*, March 13, 1886, 164; “Thick or Thin Seeding of Wheat.” *Prairie Farmer*, March 13, 1886, 164; “Drilling or Broadcast Sowing of Wheat-Which?” *Prairie Farmer*, January 19, 1895, 1; “The Hagerstown Steam Engine and Machine Company: Manufacturers of the Empire Grain Drill,” 1882, Trade Cat. .H14, Hagley Library, Trade Catalogs; *The Richmond Grain Drill* (Wayne County, IN: Wayne Agricultural Co., 1875); Victor M. Rubert, “The Pioneer’s Daily Bread,” in *South Dakota Historical Collections*, vol. 26 (Pierre: South Dakota State Historical Society, 1952), 166–69.

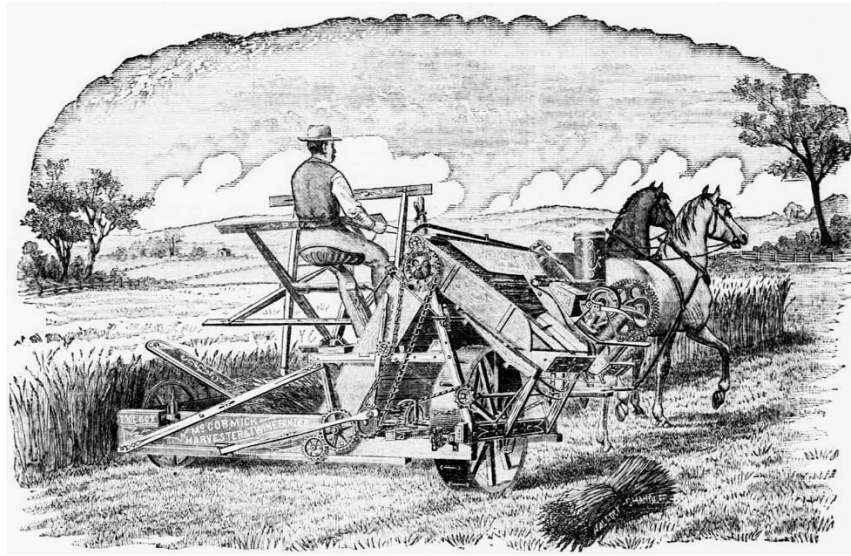


Figure 18: Depiction of a McCormick self-binding harvester in operation. McCormick Twine Binder 1884, Wikimedia Commons. [https://commons.wikimedia.org/wiki/File:McCormick Twine Binder 1884.jpg](https://commons.wikimedia.org/wiki/File:McCormick_Twine_Binder_1884.jpg).

While field machines led the way in the transition from the mid-century to late-century machine world, other machines populated the Midwest and Ontario even if their internal components remained more constant through the end of the century. Sewing and washing machines saw more widespread use as the years went on, including among families that had used field machines previously.⁹¹⁵ The demand for sewing machines was such that, in 1873, the Singer factory in Elizabethport, New Jersey, was the largest factory in the world producing and selling a single product.⁹¹⁶ While sewing machines were less related to the economic relations of the price of wheat, and were less regionally focused on wheat-producing regions, the adoption of these devices seems to have increased in later decades alongside new field machines. Sewing machines also saw some

⁹¹⁵ Allan G. Bogue, "Twenty Years of an Iowa Farm Business, 1860-1880," *Annals of Iowa* 35, no. 8 (Spring 1961): 573; "Washing Machines," *Colman's Rural World*, vol 34, no26, June 30, 1881, 208.

⁹¹⁶ Bissell, *The First Conglomerate*, 77.

new developments in their complexity. Attachments for distinct sewing tasks like embroidering and stitching were available, and companies sold a greater variety of machines, each with some special parts.⁹¹⁷

Farmers' efforts to produce as much wheat as possible also led to significant growth in the sheer quantity of machines. Midwestern states were home to nearly 1.6 million individual farms in 1880.⁹¹⁸ Where Gilbert Fite recorded that most American frontier farmers probably owned less than \$100 dollars of machinery in 1870, by the end of the 1870s manufacturers shipped their machines to frontier states on the railroads by the carload.⁹¹⁹ The inner Midwest and Ontario were also brimming with machines. An agent for McCormick estimated that the company would sell 18,000 machines in the year

⁹¹⁷ On the developments of sewing machine capabilities between 1875 and 1900, see, Godrey, *An International History of the Sewing Machine Industry*, 125-144. For examples of new devices and attachments, see, "Demorest Sewing Machine Company" (1891), Box 1, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/0807/imagepages/image1.htm>; "The Ne Plus Ultra Prices of Sewing Machines" (Chicago, n.d.), Box 18, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/2697/imagepages/image5.htm>; "The Goodrich Self-Threading Machine," n.d., Box 18, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/2687/imagepages/image8.htm>. Hounshell, 67-124, argues that the sewing machine industry developed closer to mass production and interchangeable parts in the 1880s, though he also highlights the limitations of manufacturing in the industry; "June Manufacturing Co., Manufacturers of the New and Greatly Improved Singer Sewing Machine," (Chicago, 1884), Box 18, Textiles Collection, National Museum of American History, Accessed online via Smithsonian Institution Libraries. <https://www.sil.si.edu/DigitalCollections/Trade-Literature/Sewing-Machines/NMAHTEX/2694/>. Sewing machine companies like the June Manufacturing Company, for their part, made claims for their machines to such attributes as "perfectly exact" parts during this time period.

⁹¹⁸ *U.S. Census Reports, Tenth Census. June 1, 1880: Agriculture* (Washington: GPO, 1883), 37.

<https://www.census.gov/library/publications/1883/dec/vol-03-agriculture.html>.

⁹¹⁹ Fite, 44, 105.

1875, mostly to Midwestern farmers.⁹²⁰ The 1880 U.S. census counted 35,327 reapers, 72,090 mowers, 54,920 combined reaper-mowers, and 25,737 harvesters, headers, or binders as manufactured in that year alone.⁹²¹ Much of this product was bound for the Midwest. After 1870, the number of agricultural implement manufacturers only significantly increased in Midwestern prairie states and in California, while states in the Great Lakes region remained the majority of those in which implement manufacturers increased at all.⁹²² Gordon Winder's research into regional market power demonstrates that many, if not most, of these machines were sold in the Midwest.⁹²³ In addition to the machines newly manufactured for Midwestern markets each year, there were thousands of machines already present on farms that were kept in use. While some farmers, like George Allen of Wisconsin, continued to harvest their grains primarily with sickles, farmers with no regular machine experience became rare. Allen himself, for instance,

⁹²⁰ J. H. Matthews to Cyrus Hall McCormick, August 11, 1875, McCormick Mss 1A, Box 55, C.H.M. Correspondence.

⁹²¹ "Agricultural Implements" in *U.S. Census Reports, Tenth Census. June 1, 1880: Manufactures* (Washington: GPO, 1883), 688.

https://www.google.com/books/edition/Census_Reports_Tenth_Census_June_1_1880/Xm9GAQAAMAAJ?hl=en&gbpv=0. The Census Report states that there may have been some duplication due to the ambiguity of the term, "harvester"; Rogin, 112, also suggests that the number of binders relative to reapers may be higher than these numbers indicate as many farmers made the switch to self-binders by attaching one to their machine already in use.

⁹²² "Agricultural Implements" in *U.S. Census Reports, Tenth Census. June 1, 1880*, 691-692. The states in which the number of manufacturers grew between 1870 and 1880 were Wisconsin, Iowa, Minnesota, Kansas, and California. The states in which the number of manufacturers remained consistent were Ohio, Michigan, Indiana, Illinois, Pennsylvania, and New York.

⁹²³ Winder, 57-60.

made use of mowing and threshing machines even as he continued to use implements like cradles and sickles to cut his grain.⁹²⁴ Machine use had become entrenched as the norm.

New patterns of use emerged in augmented systems of mechanized farming. Some farmers had the ability to run more than one machine at a time. The large-scale “bonanza” farms of Dakota’s Red River Valley often ran as many as seven self-binders at once.⁹²⁵ These industrial operations were undoubtedly the exception, but, by the 1880s, harvesters were common enough that some family farmers were able to run two machines at a time. Usually only one of the machines in use belonged to the farmer whose field they were harvesting. The other was usually that of a neighbor. This was certainly the case when Lydia Vinton identified two machines, each owned by a different man, operating in the same field.⁹²⁶ Some farming people ran multiple reapers while others ran multiple new self-binders.⁹²⁷ The increased presence of machines, as well as farmers’ machine knowledge, made this form of augmented use possible.

The augmentation of technological systems with more and bigger machine components brought increased expenses and debts, and machine companies fought harder

⁹²⁴ Allen, “Diaries,” July 11, 1876; Allen, “Diaries,” July 21-24, 1876; Allen, “Diaries,” July 8, 1875; Allen, “Diaries,” July 28, 1875, Allen’s use of hand implements for grains likely indicates that the grains were a less significant part of his operations than they were for other farmers.

⁹²⁵ Mary Dodge Woodward, *The Checkered Years: A Bonanza Farm Diary, 1884-1888*, ed. Mary Boynton Cowdrey (Minneapolis: Minnesota Historical Society Press, 1989), 90-91. For more on bonanza farms of the Red River Valley, see, Fite, 75-93.

⁹²⁶ Lydia Vinton, “Diaries” (1879-1899), August 13, 1890, p.182-183. Lydia Vinton and family diaries, Minnesota Historical Society, <http://www2.mnhs.org/library/findaids/01313.xml?return=brand%3Dfindaids%26q%3Dfarm%26type%5B%5D%3DManuscripts%2520collection%26yearrange%3D1830-1900>.

⁹²⁷ Cotterman, “Diary,” June 28, 1879, Box 1, Folder 2; Henry Pond, “Diary” (1888), July 2, 1888, M0751, Box 1, Folder 5, Henry Pond Papers, Indiana Historical Society; Nimrod Barrick, “Diaries” (1871-1932), August 1-3, 1908, M421, Barrick and Kennedy family papers, Minnesota Historical Society.

than ever to collect on those debts. Credit and money remained scarce, but farmers continued to rely on machines in order to produce wheat and generate the revenue necessary to make mortgage payments and otherwise keep up their farms. Purchasing still usually involved credit, and thus economic relationships with banks and machine companies on unequal terms. Credit purchasing was possible for sewing machines and washing machines as well as for larger and more expensive field machines.⁹²⁸ Machine companies also continued to pursue vigorous collections. Companies like D. M. Osborne issued official notes with which their agents recorded debts for machine purchases and strove to formalize their efforts to collect.⁹²⁹ Collection strategies varied among companies, however, and agents themselves had some discretion. Luna Kellie remembered an agent from a smaller company granting them more time to pay.⁹³⁰ One harvester agent remembered that Deering agents were instructed to get security from indebted farmers in the form of claims to crops or mortgages, while McCormick agents were instructed to take partial payment in order to get money right away.⁹³¹ The company nevertheless instructed its agents to take a hard stance and to never “let people understand

⁹²⁸ James Carpenter, “Diary,” January 2, 1883, James Carpenter Diary Collection, via Rural Diary Archive. <https://ruraldiaries.lib.uoguelph.ca/transcribe/collections/show/13>.

⁹²⁹ “D. M. Osborne Note” (D. M. Osborne, n.d.), Box 11, Folder 2, Warshaw Collection, Agriculture, National Museum of American History, Smithsonian Institution.

⁹³⁰ Kellie, *A Prairie Populist*, 84-85.

⁹³¹ “Reminiscences of William Thomas Smith As Relayed to Mr. Herbert A. Kellar,” September 6, 1930, McCormick Mss AC, Box 38, Herbert Kellar Papers, 1887-1955; The McCormick company’s strategy may have been informed by their difficulty in collections in the 1880s and 1890s. Ott has argued that McCormick had difficulty collecting in these years due to public challenges from “producer populists” like the Grangers and Farmers’ Alliances who swayed juries to sympathize with consumers. See, Daniel Ott, “Producing a Past: McCormick Harvester and Producer Populists in the 1890s,” *Agricultural History* 88, no. 1 (January 2014): 99; Somewhat similarly, Charles M. Marsh complained that higher courts lost some of their sympathy for patent-holders and began to favor the rights of consumers around the same time, “apparently in sympathy with the Granger movement.” Marsh, *Recollections*, 84.

McCormick will wait.”⁹³² Debt and the efforts of machine companies to collect was compounded by farmers’ indebtedness to banks. The McCormick company kept legal records, which included information on a number of mortgages and farm deeds in collections processes.⁹³³ Machine debt compounded other forms of farm debt; as the many creditors of farmers, including the machine companies, now fought to be paid first when farmers were unable to pay or sought to sell their land.⁹³⁴

The very expense of the machines themselves, as well as the expense of new supplemental inputs required for the machines to function, made the credit relationships of these decades more precarious and prone to collapse than in earlier decades. Self-binding harvesters, for instance, were more expensive than the reapers that preceded them. While some reapers could be purchased for less than \$100, self-binders often sold for \$300 or more.⁹³⁵ They also introduced expensive supplemental materials to the equation as well. Twine and wire became a part of many farmers’ regular purchases in town.⁹³⁶ The costliness of twine was even a problem for machine company agents, who

⁹³² McCormick Harvesting Machine Company to D. W. Pratt, August 24, 1881, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

⁹³³ “Deed L. D. Piper to C. H. McCormick and L. J. McCormick” (Mitchell County, Iowa, May 19, 1877), McCormick Mss 4X, Box 2, McCormick Harvesting Machine Company Legal and Patent Records, 1830-1896, Wisconsin State Historical Society, is but one example of the deeds contained within this sub-collection.

⁹³⁴ McCormick Harvesting Machine Company to D. E. Land, November 9, 1885, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society; McCormick Harvesting Machine Company to E. H. Everett, August 11, 1886, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

⁹³⁵ Rogin, 113n220; Lucy Griscom Morgan, *Finding His World: The Story of Arthur E. Morgan*, Second Edition (Yellow Springs: Kahoe and Company, 1928), 13.

⁹³⁶ Lydia Vinton, “Diaries,” August 5, 1882, p. 29; Lydia Vinton, “Diaries,” August 17, 1882, p. 30; John Winslow, “Diary” (1889-1893), June 22, 1895, BV 2536, John Winslow Papers, 1792-1936, Indiana Historical Society; Hiram Young, “A Hoosier in Kansas: The Diary of Hiram Young 5,” *Kansas Historical Quarterly* 15, no. 2 (July 1894): 151–85; John Campbell Bailey, “Diary” (1896), July 6, 1896, p. 33, MS-

complained of its expense as well as their concerns that farmers would look for find cheaper alternatives.⁹³⁷ Some farmers, and even their cooperative organizations, took on debt purely to purchase of binder twine.⁹³⁸ Twine thus became a supplemental material input for machine harvesting that involved more cash and debt.

Farming people turned to new machines that could raise even greater quantities of wheat out of Midwestern soil. Yet the ever-increasing expenses of the machine components of their technological systems, combined with diminishing returns of grain farming, limited their own profits. Even as industrial grain farming did not lead to straightforward profit for farming families, the trajectory of mechanization itself was clear. As farmers used greater numbers of larger and more complex machines, those machines became the center of farm systems that wrung ever more profit out of rural land and labor, that did not necessarily go to farmers themselves.

Machines at the Center of Farm Systems

Their size, complexity, and ubiquity all placed machines at the center of farm systems—a critical step in the industrialization of grain agriculture. Even as farming

BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum; John Campbell Bailey, “Diary” (1897), July 21, 1897, p. 34, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum.

⁹³⁷ “Binder Twine.” *Farm Implement News*, vol. 7, no. 12, December 1886, 12. For more on binder twine as a material part of farm life, see also, Evans, *Bound in Twine*, 1-31.

⁹³⁸ O. H. A. Shively to Mrs. J. T. Kellie (Luna A. Kellie), November 5, 1894, RG2623.AM, Microfilm, Reel 1, Frame 1078-1079, Nebraska Farmers’ Alliance papers, Nebraska State Historical Society.

people relied on environmental and animal systems to make machines work and to cultivate their crops, they made machines the foundation of cultivation—a decision which only increased their reliance upon those machines. The more they used machines, profitably or not, the less possible alternatives to mechanization became.

In the later decades of the century, the task of making machines compatible with environmental and crop systems remained an important one, but it now became common for farmers not only to adjust machines to the needs of certain crops, but to adjust crops to the needs of machines. Manufacturers continued to advertise their machines as compatible with a wide variety of crop conditions.⁹³⁹ Yet most of the responsibility for adapting and adjusting machine-use practices to specific conditions fell to farmers. They continued to cut around fields with hand implements and to adjust their usage of harvesters and threshers to deal with wet conditions or lodged grain.⁹⁴⁰ But, increasingly, it was machines that conditioned what farmers needed from the other components of crop systems. For instance, the incompatibilities between a particular strain of wheat and

⁹³⁹ Crowell Manufacturing Company (Greencastle, PA), “The Greencastle Grain, Seed, and Fertilizer Drill” (Buffalo, NY, 1890), Item ID: 08053154, Hagley Library, Trade Catalogs; Crowell Manufacturing Company (Greencastle, PA), “Improved Greencastle Grain Drill, with Fertilizer and Seed Attachments, Hay Rakes and Field Rollers” (Gies and Co. Printers, Buffalo, 1884), Hagley Library, Trade Catalogs, Item ID: 08053155; Adriance, Platt and Co., “Adriance and Buckeye Harvesting Machinery,” 1895, Item ID: 08051223, Hagley Library, Trade Catalogs.

⁹⁴⁰ Nellie L. McClung, *Clearing in the West: My Own Story* (Toronto: Thomas Allen, 2005) [Originally published 1935], 1; Harman Cotterman, “Diary” (1879), June 26, 1879, M 1290, Box 1, Folder 2, Harman and Sarah Cotterman Diaries, 1875-1933, Indiana Historical Society; Stein, “Diary,” July 13, 1880; Rollins, “Diary,” July 29, 1876; Cummins, “Diary,” July 31, 1890, Reel 2, Frame 516; Peterson, “Diary,” August 15, 1879, 410; Buttles, August 20, 1883, Reel 4; Buttles, August 5, 1898, Reel 5; Buttles, July 28, 1899, Reel 5; William Wilson, “Diaries, Volume Two” (1883-1887), July 22, 1885, p. 76, V156, William Wilson Diaries, Indiana State Library; Ruede, 147; “The Tryon Weigher and Measurer for Threshing Machines,” *Prairie Farmer*, June 27, 1891, 1; Woodward, *The Checkered Years*, 92; Allen, “Diaries,” October 5, 1876; Cummins, “Diary,” July 31, 1890, Reel 2, Frame 516; Peterson, “Diary,” August 1, 1879, 410; Woodward, *The Checkered Years*, 137; Buttles, August 23, 1883, Reel 4.

mechanical harvesters prevented Hugh Orchard's father from successfully transitioning to a new breed of Russian oats from the 1876 centennial in Philadelphia. Orchard wrote, "if you cut the way the heads mostly lay, the harvester would just push the grain down and slide right over it. Going against the way it leaned, the sickle guards just buried themselves under a great mass of tangled grain, and the elevators got clogged right up." Orchard's father altered his harvesting technique to adapt to the challenges of this crop and "cut the field all one way and cut only half a swath at a time so the elevators could handle it." While this practice was slower, and involved continually circling the binder back around, it nonetheless worked, but not without help from young Orchard himself. He recalled: "it was my job to walk behind the binder and rake the grain down into the beaters that made the bundle. [...] If I missed one stroke the whole thing would clog up, and the bull wheel would begin to drag." If that happened, his father would have to stop the operation and clean out the clogged grain himself. While this whole process demonstrated farmer knowledge of machines and an ability to adjust their use practices, the fact that the Orchards switched back to the "good old brands" of wheat for the next year demonstrates the limits that machine agriculture placed on crop cultivation.⁹⁴¹ Just as farmers had been required to adjust their use of machines according to limits imposed by their crops, now farmers had to adjust the possibilities of types of crops they could grow in order to accommodate the needs of machines.

⁹⁴¹ Orchard, 128-130.

A similar development occurred regarding the relationship between machines and animals in farm systems. Farming people still built and maintained the relationships between their harvesting machines and the animals that drove them. In fact, one advantage of steam threshing, for instance, had to do with practices of machine use and animal husbandry. Some farmers who switched to steam-powered threshing did so because they saw it as something that would free their horses from the burden of being hitched to a horse power. Ise described steam threshers as “releasing horses from the killing drag of the horse power, where horses sometimes died on hot days.”⁹⁴² When farmers did continue to use horses to power their threshing machines, there was a lot of work involved in managing those processes. Drury remembered his admiration for the man who commanded the horse power of a threshing crew, who could direct the animals in concert and flick a fly off the back of one with his whip from the center of the power.⁹⁴³ Other methods of managing horses while threshing included attaching the horses to polls in the ground in order to get them to move appropriately for the horse-sweep power.⁹⁴⁴ The management of horses in harvesting was a task as well. As such, when farmers shared machines and horses, it was sometimes the man who owned and was familiar with the horses who drove the machine.⁹⁴⁵ Farmers created other practices to protect animals from the weight of machines. John Ise’s father, for instance, would lift

⁹⁴² Ise, 168-169. For a contemporaneous defense of horse-powered machines and their effects on the health of horses, see, “The Horse Tread Power,” *Prairie Farmer*, March 20, 1897, 4.

⁹⁴³ Drury, “Growing up on an Iowa Farm,” 167.

⁹⁴⁴ Brown, “Grandmother Brown’s Hundred Years,” 131.

⁹⁴⁵ James Carpenter, “Diary,” September 13, 1883; Michie, “Self Doing Naught,” December 16, 1886; Peterson, “Diary,” August 5, 1885, p. 591-592.

the tongue of the harvester upwards when the machine was standing still, to make sure the weight of the machine did not fall on the horses when not in use.⁹⁴⁶

While most farmers continued to use horses for machine work, occasionally they found ways to employ oxen and even mules, but when they did so they forced those animals to function in ways that fit the requirements of the machines.⁹⁴⁷ The necessity that animals pull harvesters at a certain speed for them to operate properly made harvesting with oxen difficult. Nellie McClung's family experienced the difficulty of the disparity between typical ox and horse speeds when they pulled a harvester with two oxen and a horse at the same time. The horse was accustomed to moving faster than the oxen and would bite them while working, "but this was remedied by checking her head up so she could not reach them."⁹⁴⁸ Oxen alone, however, might not generate sufficient speed for the machines. Sarah Ellen Roberts recalled that their family had to have two men driving the machine, rather than one, when using oxen to pull a binder: one to drive the machine, and the other to whip the oxen. They believed this arrangement was necessary because the oxen tended to walk too slowly to power the binding mechanism ; moreover, oxen were more likely than horses to get distracted.⁹⁴⁹ Farm families thus coerced animals into types of labor that seemed unusual for those animals in order to meet the needs of preeminent machines.

⁹⁴⁶ Ise, 288.

⁹⁴⁷ Biggar, 15; Hearst, 6.

⁹⁴⁸ McClung, *Clearing in the West*, 137.

⁹⁴⁹ Sarah Ellen Roberts, *Of Us and Oxen* (Saskatoon: Modern Press, 1968), 215.

The need to make mechanical and animal systems compatible shaped the adoption of twine for grain binding as well, and it was the centrality of threshing machines that actually conditioned how new technologies of harvesting could be used. While the use of wire on self-binding harvesters was initially more common, twine quickly superseded it. Wire caused problems when animals ate leftover pieces that made their way into hay. Yet, wire also caused internal machine compatibility problems because it could damage the teeth and other components of threshing machines if accidentally tossed in with bundles of grain.⁹⁵⁰ In the end, it was the compatibility of twine with both the animals on farms, as well as with the threshing machines already on farms, that gave farmers' favor to twine over wire. Threshers were thus components that were now as much at the center of technological systems as animals were, and conditioned what types of new technological components could be adopted alongside them.

Farmers also demonstrated and entrenched the centrality of threshers in farm systems by training new types of horses for specific animal tasks built around machine threshing. In addition to simply training horses to power the machines, farmers and blacksmiths used new methods of shoeing horses so that horses would not damage treadmill-powered threshers.⁹⁵¹ They also devised new tasks for horses when using large threshers that churned out large volumes of discarded straw. Threshing with these machines required horses to pull that straw away from the machine so that it would not

⁹⁵⁰ "St. Joseph County Fair." *Grange Visitor*, June 1, 1878, vol 4., no. 11, p. 4; Biggar, 11; Ise, 132; Ardrey, 114-115.

⁹⁵¹ "Horse Power Machines. St. Alban's Foundry Company" (St. Albans, VT, 1891), 08060164, Hagley Library, Trade Catalogs.

get in the way of horses or threshers or provide kindling to an accidental fire. Farmers trained specific horses not for the task of powering a threshing machine, but instead to haul away the piles of straw spun out of the machine. Nellie McClung described the work of these invaluable “straw horses:”

When the pile of straw grew so high it had to be removed, the “straw horses” advanced without anyone telling them, one on each side of the straw pile, and by means of the straw rake to which they were hitched, one at each end, they drew the pile to one side and turned around, stood at attention until the pile was again high enough to be taken away. When a team was trained to do this, they became valuable possessions to their owner and their services were well paid for.⁹⁵²

The use of straw horses demonstrates how farming people used animal labor, and changed their animal systems, to occupy new roles within farm systems in which machines were increasingly at the center.

Complicated, expensive, and essential machines were not only at the center of increased wheat production in the economy. They were also now at the center of the everyday environmental and animal systems of farm production. Farmers also placed machines at the center of systems of human labor. Within the social relations of human labor, however, machines became points of conflict within these social relationships and within systems of production.

Machines and Conflict in Farming Families and Communities

⁹⁵² McClung, *Clearing in the West*, 403-404.

The same dynamic of increased reliance on augmented technological systems of farming brought machines to the center of family and community labor. Farm families continued to divide the labor of mechanized agriculture similarly to how they had in earlier decades.⁹⁵³ Yet within farm families, the post-1873 economic conditions that pushed farmers to increase field sizes and to grow ever more grain did not pressure them to adopt sewing and washing machines in the same way as new field machines. Nevertheless, the increased availability of those machines made their potential use a point of conflict within farm families. Additionally—within farming communities, hired labor

⁹⁵³ Men continued to take the lead when working with field machines, but children and women often performed peripheral, though essential tasks, including bringing water to men working and mending sacks used to hold cut or threshed grain. Additionally, women drove field machines when men were otherwise unavailable for particular reasons like illness. See, Herbert Vinton, “Diary” (1888-1889), July 28, 1888, Lydia Vinton and family diaries, Minnesota Historical Society, <http://www2.mnhs.org/library/findaids/01313.xml?return=brand%3Dfindaids%26q%3Dfarm%26type%5B%5D%3DManuscripts%2520collection%26yearrange%3D1830-1900>; Herbert Vinton, *Diaries*, July 31, 1888, the young Vinton also participated in maintenance by fetching “repair pieces” from town when a mower broke; “The Champions Reaping and Mowing Machines.” *Prairie Farmer*, April 29, 1876, 138; Peterson, “Diary and Translation,” August 20, 1883, June 29, 1887, July 21-26, 1887, 520-521, 664-667; Eliza Ann MacFarlane, “Diary” (1887-1901), August 8, 1899, Eliza Ann MacFarlane Diary Collection, 1887-1901, via Rural Diary Archive. <https://ruraldiaries.lib.uoguelph.ca/transcribe/collections/show/86>; Rolf Johnson, *Happy as a Big Sunflower: Adventures in the West, 1876-1880* (Lincoln: University of Nebraska Press, 2000), 119-120; Clifford Merrill Drury, “Growing up on an Iowa Farm, 1897-1915,” *Annals of Iowa* 42, no. 3 (Winter 1974), 181; See also, McClung, *Clearing in the West*, 153; Merrill R. Pierson, “Threshing in the Age of Steam: A Reminiscence by Merrill R. Pierson,” *Palimpsest* 62 (September 1981): 147; Henry Pond, “Diary” (1883), July 3, 1883, M0751, Box 1, Folder 3, Henry Pond Papers, Indiana Historical Society; Eliza Ann MacFarlane, “Diary,” July 19, 1889; Marsh, *Recollections*, 137; Susanne K. George, *The Adventures of the Woman Homesteader: The Life and Letters of Elinore Pruitt Stewart* (Lincoln: University of Nebraska Press, 1992), 4; Laura Ingalls Wilder, *The First Four Years* (New York: Harper Collins, 1971), 81-82; Kellie, 82-86; Paul, *Memoirs*, 58-62; James Carpenter, “Diary” (1880-1884), June 14, 1883; Amanda Cool and J. Cool, “Diary” (1879-1885), June 23, 1883, MS 953.06, Amanda and J. Cool Diary, 1879-1885, Kansas State Archives, pg. 316; H. Clare Welker, “Our First Year on a Nebraska Farm: A Reminiscence,” *Nebraska History* 37, no. 1 (March 1956), 56; Buttles, August 23, 1882, Reel 4; Mamie E. Griswold, “Diary, January 1878-December 1882” (1878-1882), June 26-27, 1878, p. 13, MS-BC260, Box 4, Henry A. Griswold papers, Abraham Lincoln Presidential Library and Museum; Mamie E. Griswold, “Diary, January 1878-December 1882,” July 22, 1878, p. 15; Mamie E. Griswold, “Diary, January 1878-December 1882,” September 2, 1878, p. 18; Ann M. Brackett, “Journals, Volume Four” (September 30, 1884-October 11, 1887), September 9, 1885, p. 73, Ann M. Brackett journals, William L. Clements Library, University of Michigan.

superseded reciprocally shared labor in mechanized farm processes, as machines dominated relationships between employing farmers and hired workers.

Sewing and washing machines became more common in the later decades of the century, though farm families generally continued to prioritize field machines over sewing or washing machines. This was partially because husbands and fathers controlled financial decision-making, but also because field machines contributed directly to the income of a farm family in a more quantifiable way than sewing or washing machines did. John Ise, for instance, praised his mother for her selflessness and prudence for delaying the purchase of a washing machine for years, while supporting “anything in the way of farm equipment” as a “productive investment, likely to bring returns to the family.”⁹⁵⁴ Farmers’ prejudice in favor of field machines as “productive” remained indicative of their efforts to produce their way out of the perils of falling wheat prices and detrimental credit.

Nevertheless, some farm women spoke against the preference given to field machines, and in doing so made their own claims as producers on and of the modern farm. A McCormick company agent wrote that, “Women were harder to get along with than the men. This was especially true where the property was in their name. They usually said the men could get along without the machine.”⁹⁵⁵ The sentiment expressed

⁹⁵⁴ John Ise, *Sod and Stubble: The Unabridged and Annotated Edition* (Lawrence: University of Kansas Press, 1996), 232.

⁹⁵⁵ “Reminiscences of G.N. Frazier” in Herbert A. Kellar, “Harvester Reminiscences By Members of Harvester Club of Southern California” (1930), McCormick Mss AD, Box 18, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

by those women may have been echoed by farm wife Ardie Bee of Manchester, Iowa, who wrote an article asking men to not deny their wives and children comforts just so that every spare cent could be spent on buying more land and field machines to maximize yields.⁹⁵⁶ Some women thus expressed a skepticism of the over-mechanization of the field which may have been rooted in their own experiences of machine-use, in which mechanization did not necessarily alleviate household labor.⁹⁵⁷

On the other hand, some rural women made the case for household machinery as a central component of the industrial and modern farm, and thus bolstered their own claims as equal producers alongside men. These women looked forward to future technological improvements with hope for household machines alongside field machines. Canadian Suffragette Nellie McClung lamented that “when there is a good crop the men buy more land or more machinery for themselves. I’m not begrudging them their machines, but the women could do with some help, too.”⁹⁵⁸ Another paper offered the possibility of better dish washing machines “to help the tired women”⁹⁵⁹ Populist activist Fannie McCormick also lamented that, in comparison to the machines of the fields, “machinery has as yet wrought but little benefit to farmers’ wives.” She asserted the imperative to alleviate women’s toil through machinery not by appealing to the comforts of an ideal domesticity, however, but instead by appealing to women’s status as fellow

⁹⁵⁶ “Not a Deserter.” *Western Rural*, January 31, 1885, 70.

⁹⁵⁷ Such a reality would resonate with the arguments of Cowan, *More Work For Mother*.

⁹⁵⁸ Nellie L. McClung, *The Stream Runs Fast* (Toronto: Thomas Allen, 2007) [Originally published, 1945], 204.

⁹⁵⁹ Notice. *The Rural Home* (Lawrence, Kansas), May 1899, Vol. 1, No. 3, 8. Newspapers.com. <https://newscomwc.newspapers.com/paper/the-rural-home/11092/>.

producers. She wrote, “The farmers’ wives are not ‘help-meets’ [...], but have done their full share of solid, hard work as *equal partners*.”⁹⁶⁰ Women with access to their own sources of income, even small ones, sometimes used this money to purchase sewing machines on their own.⁹⁶¹ Some farm women thus championed the use of sewing and washing machines as central to their contribution to the production of the modern farm and struggled to assert their own status as producers. Machines were thus at the center of conflicts about family labor on the farm.

Machines were also at the center of family labor systems because when farm families came to adopt domestic machinery, they did so in a context that was already shaped by the presence of field machines. Sewing machine advertisements in the 1870s maintained that they could be used “without instruction or experience.”⁹⁶² Such claims were less necessary for field machines, whose manufacturers could assume that consumers already had some experience with the same type of machine.⁹⁶³ Additionally, when farming women made and mended clothes by machine, they did so for a world populated by other machines. For instance, Luna Kellie made shirts with her sewing machine for hired workers and her husband and she took care to make sure they would stand up to the tasks of machine work.⁹⁶⁴ The adoption of sewing machines as a

⁹⁶⁰ “A Kansas Farm.” *Farmer’s Wife*, September 1891, 1. Newspapers.com. <https://newscomwc.newspapers.com/paper/the-farmers-wife/9505/>.

⁹⁶¹ “Franklin Co., Ill.” *Prairie Farmer*, February 6, 1886, 85.

⁹⁶² “New Wilcox and Gibbs Automatic Tensions Silent Sewing Machine,” Advertisements. *Godey’s Lady’s Book*, January 1876, 103.

⁹⁶³ Ise, 232, though Ise’s mother forewent the use of a washing machine for a long time, the family did purchase a sewing machine; Catherine Wiggins Porter, “A Little Girl on an Iowa Forty, 1873-1880,” ed. Kenneth W. Porter, *Iowa Journal of History and Politics* 51, no. 2 (n.d.): 139.

⁹⁶⁴ Kellie, *A Prairie Populist*, 83, 95, 99.

component of mechanized farming was thoroughly connected to the systems and practices of field machine use.

Washing machine use, though less common than the use of sewing machines, was likewise shaped by established systems of mechanized farming. With or without hand-turned washing machines, farm women did most of the weekly washing of clothing and other fabrics, though they sometimes received help from their husbands.⁹⁶⁵ The introduction of machines may have drawn men into this labor process even more, as the turning of hand-powered washing machines required a fair amount of strength. Drury recorded that turning the washing machine was his father's responsibility on wash days.⁹⁶⁶ James Hearst lamented that turning the washing machine was his duty as a young man, while his mother "sorted the clothes, rinsed them, and hung them on the line."⁹⁶⁷ Nevertheless, both young and adult women were often responsible for powering the washing machines themselves.⁹⁶⁸ Washing machine work was also shaped by the presence of field machines in systems of mechanized agriculture. Anyone doing the washing now had to contend with the grease and oil that accompanied machine work. An 1883 article for the *Prairie Farmer* noted that "cold rain water and soap will remove machine grease from washing fabric."⁹⁶⁹ Other papers offered similar advice on washing

⁹⁶⁵ Cotterman, "Diary," September 3, 1888, Box 1, Folder 3; William F. Swan, "Diary" (1882), January 26, 1882, M 0404, Box 2, Folder 2, Ione Swan Paugh Collection, 1872-1971, Indiana Historical Society; Lorenzo Dow Brown, "Journal Transcriptions," June 2, 1877, Box 4, Folder 3, p. 48; Rollins, "Diary," September 23, 1878; Barrick, "Diary," July 14, 1890; Allen, "Diaries," May 31, 1876.

⁹⁶⁶ Drury, "Growing up on an Iowa Farm," 178.

⁹⁶⁷ James Hearst, *Time Like a Furrow: Essays* (Iowa City: Iowa State Historical Department, Division of the State Historical Society, 1981), 239.

⁹⁶⁸ Nell Wilson Parsons, *Upon a Sagebrush Harp* (Saskatoon: Prairie Books, 1969), 36-37.

⁹⁶⁹ "Remember." *Prairie Farmer*, September 29, 1883, 613.

out machine grease and oils.⁹⁷⁰ New techniques were required in washing practices to accommodate the systems of mechanized agriculture already constructed on the farm.

Machines were also placed at the center of labor systems that extended beyond the farm family into rural communities. Farming people continued to share both machines and work with their neighbors. Sewing and washing work was no exception, as machines became a feature of common labor.⁹⁷¹ Farming families continued to share harvesting machines. They also shared drills as those devices became more common on Midwestern farms.⁹⁷² Threshing time remained a period of intense cooperation. Even as they relied even more on professional threshermen, farmers still relied on neighbors for the work involved around the machine.⁹⁷³ Women also sometimes helped one another to

⁹⁷⁰ "Hints for the Housekeeper." *The Rural Home* (Lawrence, Kansas), August 15, 1899, Vol. 1, No. 6, 13.

⁹⁷¹ Coleman, "Diary," August 26, 1884; James Carpenter, "Diary," (1880-1884), February 8, 1881; James Carpenter, "Diary," (1880-1884), April 2, 1884; Ise, 108-109; W. H. Hamilton, "Dakota: An Autobiography of a Cowman," in *South Dakota Historical Collections*, vol. 19 ([pub], 1938), 603; McClung, *Clearing the West*, 314; Mamie E. Griswold, "Diary, January 1883-December 1894" (1883-1894), March 6, 1885, p. 54, MS-BC260, Box 4, Henry A. Griswold papers, Abraham Lincoln Presidential Library and Museum; Mamie E. Griswold, "Diary, January 1895-December 1902" (1895-1902), July 9, 1895, p. 14, MS-BC260, Box 4, Henry A. Griswold papers, Abraham Lincoln Presidential Library and Museum; Mamie E. Griswold, "Diary, January 1895-December 1902," February 9, 1900, p. 124.

⁹⁷² Karen Miller, *Many Danes, Some Norwegians: Karen Miller's Diary*, ed. John W. Nielsen, trans. Ninna Engskow (Dana College, Blair, NB: Lur Publications, 1997), 63; Orchard, 155; Clarence D. Vawter, "Diaries" (1911-1913), MS 958, Clarence D. Vawter papers, 1848-1913, Kansas State Archives; Vawter, "Diaries," October 29, 1912; Crowell Manufacturing Company (Greencastle, PA), "Improved Greencastle Grain Drill, with Fertilizer and Seed Attachments, Hay Rakes and Field Rollers" (Gies and Co. Printers, Buffalo, 1884), Hagely Library, Trade Catalogs, Item ID: 08053155. Pg. 15; H. Clare Welker, "Our First Year on a Nebraska Farm: A Reminiscence," *Nebraska History* 37, no. 1 (March 1956), 55; Henry A. Griswold, "Diary, January 1872-December 1879," July 8-9, 1876, p. 110; Henry A. Griswold, "Diary, January 1872-December 1879," June 24, 1879, p. 181; Henry A. Griswold, "Diary, January 1880-December 1884" (1880-1884), July 1881, p. 38, MS-BC260, Box 1, Henry A. Griswold papers, Abraham Lincoln Presidential Library and Museum; Henry A. Griswold, "Diary, January 1880-December 1884," July 1883, p. 86-87; Henry A. Griswold, "Diary, January 1880-December 1884," July 7, 1884, p. 110.

⁹⁷³ Duncan MacFarlane, "Diary" (1882-1884), September 26, 1885, Duncan MacFarlane Diary Collection, Rural Diary Archive. <https://ruraldiaries.lib.uoguelph.ca/transcribe/collections/show/46>; Drury, "Growing up on an Iowa Farm," 182; Cummins, "Diary," (August 23, 1876), Reel 1, Frame 1649; Clark, *Rain Follows the Plow*, 143-144; Allen, "Diaries," August 1, 1881.

prepare the threshing meals and shared the use of sewing machines.⁹⁷⁴ Sharing work and machines continued to have its drawbacks, as the inability to secure a machine when needed could be an inconvenience at best. Hiram Young recorded this frustration: “I went to Jack Matthews this morning. Then sent Davy to Ike Woodruffs then Henderson, then Secrists, then home for mowing machine and failed at all places.”⁹⁷⁵ Distance was an impediment to machine sharing, but even where farmers lived far apart from one another, some sharing did occur.⁹⁷⁶ Farming communities thus continued to fit machines into labor practices of reciprocity and placed machines at the center of those practices, but machines themselves influenced the forms that shared work could take.

Machines and Conflict between Farmers and Hired Workers

Machines likewise came to a place at the center of systems of labor organization that relied on hired workers. By the end of the 1870s, the social divisions between hired

⁹⁷⁴ Drury, “Growing up on an Iowa Farm,” 182; Cook wagons also came onto the scene in the later decades of the century, which eventually relieved women of this responsibility and trended towards a time in which, as one advertisement read, “the machine man furnishes everything,” though their widespread adoption would not come until the twentieth century. “Threshing Outfits.” *Farm Implement News*, vol. 7, no 10. October 1886, 13; See also, Rikoon, *Threshing in the Midwest*, 124-127. For examples of women sharing sewing machines in this time period, see, Lou Pierson to Sister Em, June 21, 1885, HM 81109, Pierson Family Correspondence, Huntington Library.

⁹⁷⁵ Hiram Young, “A Hoosier in Kansas: The Diary of Hiram Young 3,” *Kansas Historical Quarterly* 14, no. 4 (n.d.): 437; See also, Russell, “Diary,” (September 22, 1886), 285; Ise, 132.

⁹⁷⁶ J. H. Biggar, *These Eighty-One Years* (Chicago: Prairie Press, 1935), 15; Walter Riley Howe, “Diaries” (1906-1966), July 5, 1906, MS 1013, Walter Riley Howe diaries, 1906-1966, Kansas State Archives; Amanda Cool and J. Cool, “Diary” July 7, 1880; Hiram Young, “A Hoosier in Kansas: The Diary of Hiram Young 3,” 437; Adriance, Platt and Co., “Adriance and Buckeye Harvesting Machinery,” 1895, Item ID: 08051223, Hagley Library, Trade Catalogs. Machine companies continued to advertise their machines as more easily transportable than others.

farm workers and property-owning farmers had grown, as poor economic conditions in the wake of the Panic of 1873 made it more difficult for hired workers to start farms of their own, and new conflicts emerged. Nevertheless, despite the rare occasion of sabotage and violent retaliation, the divisions between employing farmers and hired workers were less severe than those between large capitalists like machine manufacturers and the agricultural population as a whole.⁹⁷⁷ When conflicts between farmers and workers did occur, machines, and thus the technological systems of farm production, were often at their center.

In the later decades of the century, economic conditions were such that practices of reciprocal labor and machine sharing gave way to a greater reliance on either hired help or on family labor that was augmented by individually-owned machines. One farmer wrote to the *Prairie Farmer* to complain that western farmers did not share work or otherwise help one another out as much as they should. The editor responded that it was not so much a regional difference the old farmer was noticing, but a temporal one: “possibly if our Eastern raised farmer were to go back to New England, or to New York now, he would find many of these old institutions passed away.”⁹⁷⁸ Wheat farmers in the latter decades of the century were under greater pressure to produce greater quantities of grain for market. Reliance on family labor and machines made it easier for farmers to meet increased production demands to keep their operations afloat without depending on

⁹⁷⁷ On the nature of class divisions within the nineteenth-century agricultural community, see, Cunningham, “Men on the Move”; Schob, *Hired Hands and Plowboys*.

⁹⁷⁸ “Mutual Aid.” *Prairie Farmer*, September 12, 1874, 289.

the contingencies of informal patterns of sharing work, and without having to spend as much time away from the labors of their own farms. Meanwhile, the increased difficulty of hired workers to achieve land-ownership in the economically lethargic 1870s created a broader population of farm workers available for employment.⁹⁷⁹

Nevertheless, the editor agreed with the farmer that the decline in reciprocal community labor was to be lamented. He wrote, “It is true that Western farmers would make more money, live in pleasanter relations, and have their tables supplied with a greater variety of food at less cost than now, if they established more cooperative relations with their neighbors.” The editor went on to recommend that farmers split the costs of machines like grain drills between one another through sharing.⁹⁸⁰ While such practices of sharing continued to some extent, individually-owned machines, whether worked by farm families or hired workers, became more common.

Shared labor was often replaced with hired labor. The social divisions between land-owning farmers and hired workers increased as more hired men left the country for cities or took on migratory forms of harvest labor. These included the “nomads who had followed the line of ripening wheat from Missouri northward” as well as the “errant sons of the poor farmers and rough mechanics of older states” that Hamlin Garland observed doing more of the reaping and threshing over the decades.⁹⁸¹ Even those agricultural workers who came from local farm families found themselves less able to climb the

⁹⁷⁹ For more on the decline of shared labor by the end of the century, see, Blanke, 28.

⁹⁸⁰ “Mutual Aid.” *Prairie Farmer*, September 12, 1874, 289.

⁹⁸¹ Hamlin Garland, *A Son of the Middle Border* (New York: MacMillan, 1920), 156, 174-75.

“agricultural ladder” in the later decades of the century than they were in the 1850s and 1860s. Farmers’ sons often aspired to move from work on their father’s farm as a child, to hired work as a young man, sometimes tenancy thereafter, before finally being able to achieve the self-possession that accompanied owning one’s own productive land. This ideal pathway was an important feature of the mid-nineteenth century but was curtailed after the Panic of 1873 as scarcity of currency made good wages hard to come by while tight credit and the rising expenses of starting a farm made the path to proprietorship steep.⁹⁸²

Hired laborers were thus a central part of machine labor systems, even as machines were increasingly placed at the center of those systems. Traveling threshing crews, whether composed of local families or more professional operations, remained in demand.⁹⁸³ Accommodating these crews brought work to the whole family. Luna Kellie’s husband, for instance, built a larger shed to accommodate not only the size of threshing machines, but also the size of threshing machine crews.⁹⁸⁴ Machine work also gave farmers something else to look for in potential hired workers, as responsible machine use and maintenance practices became important for anyone on the farm. The large “bonanza

⁹⁸² Gates, 272-275; Cunningham, “Men on the Move,” 30, 95-136, finds that many farm hands scaled the “agricultural ladder,”—by which a farmer’s son would begin his career as a hired hand, rise to tenancy and eventually secure a farm of his own. While the ability of farmer’s sons and other hired hands to achieve proprietorship declined over the last three decades of the century, a majority of the farm laborers Cunningham sampled from U.S. census listings in six rural Midwestern communities were the sons of farmers; Cunningham contrasts her findings with David Schob’s view of a starker division between the lives and perspectives of farmers and those of farm laborers, Schob, 271.

⁹⁸³ Biggar, 12.

⁹⁸⁴ Kellie, *A Prairie Populist*, 83-85. For other women who did the work of preparing spaces for hired hands, see, Mamie E. Griswold, “Diary, January 1883-December 1894,” April 21, 1885, p. 57.

farm” operations of the Dakota’s Red River Valley benefited from farm workers with mechanical skills due to the greater numbers of machines used on these large operations.⁹⁸⁵ Yet even ordinary small farmers now owned machines, and the *Prairie Farmer* therefore warned “the boy who knows nothing about the care of horses or the management of machinery [...] unless the farmer keeps a watchful eye, his teams will be neglected, and his machinery broken or damaged by misuse.”⁹⁸⁶ The ubiquity of machines within systems of grain farming shaped the ways in which farmers sought and mobilized hired labor, as the presence of machines brought a new set of demands on laborers in the form of skills and knowledge required to use machines.

Machines were also at the center of conflicts between hired workers and employing farmers, which often occurred on an individual level. For instance, an aspiring homesteader in west-central Kansas named Howard Ruede disagreed with his employer over issues of machine work, and the conflict may have shaped his own ability to use machines on his farm later. Ruede, like others who used harvesting machines as hired hands, remarked on the difficulty of machine work.⁹⁸⁷ His employer, Henry Landes chastised Ruede for not binding well enough, while Ruede contended this was a result of Landes assigning him the more difficult end of the task that took place in a system on the intersection of machines and crops. While both Ruede and Landes drove the machine,

⁹⁸⁵ Mary Dodge Woodward, *The Checkered Years: A Bonanza Farm Diary, 1884-1888*, ed. Mary Boynton Cowdrey (Minneapolis: Minnesota Historical Society Press, 1989), 36.

⁹⁸⁶ Jim L. Irwin. “Wanted: A Farm Hand.” *Prairie Farmer*, August 12, 1899, 1.

⁹⁸⁷ Ruede, 107. For other hired workers who remarked on the difficulty and speed of such physically demanding harvest labor, see Clampitt, 52; Biggar, 10-11.

Ruede believed Landes assigned him the task of binding the heavier patches of grain.⁹⁸⁸ Not long after this incident, Landes went to see a self-binder at work.⁹⁸⁹ Such a machine might have eliminated, or at least reduced, the need for Ruede's labor as a binder. The fact that Ruede had a claim of his own and would not rely on employment from Landes in future years meant that this might not concern him. What was more concerning to Ruede was that during the next harvest, after he had already quit and moved to working on his own claim, he could not get anyone to cut his grain by machine and ended up borrowing a cradle.⁹⁹⁰ Ruede's strained relationship with an established farmer nearby—who Ruede might have otherwise relied upon for use of a machine—may have contributed to his inability to use one himself. Machines thus served as both a terrain on which conflicts between hired hands and employing farmers played out, as well as a tool at the machine-owner's disposal in those conflicts.

Conflicts between employing farmers and their hired hands could also take place on a larger scale and with greater violence. It was in the 1870s, which had seen the Panic of 1873 as well as the decline of the Granger movement after 1875, that the Midwest experienced perhaps the most significant streak of agricultural machine-breaking in U.S. history.⁹⁹¹ In the summer of 1878, reports of conspicuously broken harvest machinery

⁹⁸⁸ Ruede, 110-111.

⁹⁸⁹ Ruede, 113.

⁹⁹⁰ Ruede, 233.

⁹⁹¹ Peter H. Argersinger and Jo Ann E. Argersinger, "The Machine Breakers: Farmworkers and Social Change in the Rural Midwest of the 1870s," *Agricultural History* 58, no. 3 (1984): 393-410, argue that the rural workers who participated in these acts of sabotage and resistance targeted certain farmers and machines who most threatened their traditional practices of rural labor and social life; The process of farm mechanization in the nineteenth-century saw comparatively less plebian resistance than the process of farm mechanization in other times and places. On English examples, see, E. J. Hobsbawm, "The Machine

spread from a number of farming communities in Southwestern Ohio to as far away as Minnesota, and commercial newspapers reflected the outrage not only of farmers, but also of city-dwelling merchants and capitalists who abhorred this assault on property. Sometimes the perpetrators left notes, identifying themselves as “laborers” and warning farmers not to make use of machines, while, in other instances, they simply destroyed machines with no trace of the perpetrators found. Commercial newspapers blamed transient workers, or “tramps” for the crimes and encouraged farmers to take violent action in defense of their property. The *Cincinnati Daily Gazette* reported, “the farmers are sticking up posters on their grounds, warning tramps on the penalty of a load of shot to trespass neither fields nor forests.”⁹⁹² More machines were found destroyed in York county several days later and more threats from farmers and commercial newspapers followed.⁹⁹³ Newspapers also noted that the breakers, in their targets and in their notes, expressed a particular antipathy for self-binding reapers. Binders not only changed the character of harvest labor, as other machines had, but now eliminated the need for men to act as binders at all. While earlier machines had been the subject of some limited consternation before, the self-binders drew the ire of America’s machine breakers in the

Breakers,” *Past and Present*, no. 1 (February 1952): 57–70; Edward P. Thompson, *The Making of the English Working Class* (New York: Vintage Books, 1966), 472-602. E. J. Hobsbawm and George Rudé, *Captain Swing* (New York: Pantheon Books, 1968). For a twentieth-century discussion of agricultural workers’ resistance to mechanization, see, James Scott, *Weapons of the Weak: Everyday Forms of Peasant Resistance* (New Haven: Yale University Press, 1985).

⁹⁹² “Communists at Work in Fairfield County.” *Cincinnati Daily Gazette*, June 29, 1878, 1.

⁹⁹³ “Burning the Reaping the Machines.” *Cincinnati Daily Gazette*, July 3, 1878, 1.

late 1870s.⁹⁹⁴ Commercial papers argued that the breakers' anger at these particular machines was an "advertisement" in their favor.⁹⁹⁵ As machine-breakers targeted the newest and most complicated machines of the late 1870s, they challenged the claims of employing farmers and manufacturers alike to control of the technological systems of mechanized agriculture.

Yet even as commercial newspapers attempted to blame tramps for the destruction, it is significant that this spark of machine-breaking resistance took place in 1878, when even land-owning farmers were coming to terms with their own defeat at the hands of machine manufacturers. Peter H. and Jo Ann E. Argersinger argue that it is unlikely that all of the machine-breaking "laborers" were, as newspapers declared, "tramps" or transient workers. In fact, their sabotage strategies, and the delivery of threats by posted signs and mail, seem to have relied on an intimate knowledge of particular proprietors' habits and farms.⁹⁹⁶ Many breakers were likely local farm hands, some of whom may have either been proprietors themselves at some point or aspired to be. Nor is it impossible that small farmers themselves participated in the destruction of wealthier commercial farmers' machines. Those farmers whose own economic position was closest

⁹⁹⁴ For examples of harvest workers refusing to work with earlier farm machines, or simply expressing distrust of them, see, Schob, 87-90, 107; Crowder, 175, mentions both the Marsh harvester and self-binders as sparking some consternation about the elimination of demand for labor.

⁹⁹⁵ "Destruction of Machinery." *New York Herald*, July 6, 1878, 4, Readex: America's Historical Newspapers <https://infoweb-newsbank-com.proxy.wm.edu/apps/readex/publication-browse?p=EANX&t=pubname%3A11A050B7B120D3F8%21New%2BYork%2BHerald>; *The Daily Picayune* (New Orleans), June 26, 1878, 1, Readex: America's Historical Newspapers. <https://infoweb-newsbank-com.proxy.wm.edu/apps/readex/publication-browse?p=EANX&t=pubname%3A1223BCE5B718A166%21Times-Picayune>.

⁹⁹⁶ Argersinger and Argersinger, 409.

to aspirational hired hands were likely those most invested in the Granger movement.⁹⁹⁷

While both farm workers and small farmers had reason to associate machines not only with mechanical progress, but also with social progress and the alleviation of the laboring classes' toil, they had nevertheless just been given reason to doubt their own ownership of the technological systems of industrial agriculture. The failures of the Granger movement made it appear that industrial farming hardly belonged to farmers, let alone to hired hands.⁹⁹⁸ Members of farming communities were thus in the midst of multiple struggles over these technological systems by the end of the 1870s.

The farm press rallied around the position of property-owning farmers and defended farmers and their machines against the sabotage. The *Prairie Farmer* joined the urban commercial papers in condemnation of these “outrages by harvesters” and connected them to recent property destruction perpetrated against a railroad by

⁹⁹⁷ Gerald L. Prescott, “Farm Gentry vs the Grangers: Conflict in Rural America,” *California Historical Quarterly* 56, no. 4 (Winter 1978): 328–45, shows that wealthier farmers, whose division from hired laborers was starkest, were often more likely to oppose the Grange than their small and middling fellows; Blanke, 117-122, 221-225, also calls attention to the democratic character of Grange membership, being composed primarily of small and middling farmers. For findings that indicate that some Granges were instead founded by wealthier members of rural communities, see Scott, “Grangerism in Champaign County, Illinois, 1873-1877,” 147.

⁹⁹⁸ Scott, *Weapons of the Weak*, 248-255, discusses the sabotage of harvesting combines in a twentieth-century context elsewhere in the world as a small tool with which the powerless exerted some resistance against the designs of their employers; Hobsbawm and Rudé, on the other hand, call attention to the sympathy many farmers had for farm laborers who sabotaged machines, asserting that “in their different ways, the farmers were as Luddite as the laborers.” Appendix IV, “The Problem of the Threshing Machine,” in Hobsbawm and Rudé, 359-365; Seeing as the relationship between Midwestern farmers and hired workers is more analogous to the situation described by Hobsbawm and Rudé than that described by Scott, it is therefore useful to consider the breakages of Midwestern farm machines in the 1870s in the context of the failure of the Granger Movement to assert power over the farm machine industry on behalf of the rural population. While hired men and farm-owners could be, to some extent, on opposite sides of the machine question, it is telling that American harvesters did not turn to machine breaking until the very period in which the democratic vision of machine ownership advanced by the largest farmers' organization experienced defeat.

disgruntled workers.⁹⁹⁹ Over the course of July 1878, machine breaking had evidently spread to some extent through the Midwest, as the *Prairie Farmer* commented on an instance that had occurred in Minnesota:

Lately a farmer, near Winona, Minn., thus took the law in his own hands and promptly shot to death two scoundrels who he found burning his harvesting machinery. He then promptly surrendered himself to the authorities, and upon trial was justified by the jury in the shooting.

The *Prairie Farmer* continued with an attempt to make clear where farmers' loyalties should lie when it came to conflict between the working and employing classes, stating, "every farmer in the land is a capitalist."¹⁰⁰⁰ It is clear that the agricultural press, and some farmers along with it, drew battle lines against the destruction of their property.

Yet not all farmers took such an adversarial line against hired workers. Granger-friendly papers were clearly also paying attention to the destruction of machines in 1878 and may provide a better example of the perspectives of the broader farming community. The *Grange Visitor*—the official organ of the state Grange of Michigan—ran multiple articles considering questions about whether machinery benefited or harmed hired laborers. These articles directly defended farm machines as a boon to farmers and hired hands alike. The Granger papers were, however, decidedly less combative than commercial papers, or even the *Prairie Farmer*, and did not mention the acts of vandalism and sabotage outright.¹⁰⁰¹ The *Grange Visitor*, like many farmers, was

⁹⁹⁹ "Outrages by Harvesters." *Prairie Farmer*, July 13, 1878, 220.

¹⁰⁰⁰ "Tramps and Legislation." *Prairie Farmer*, August 3, 1878, 244.

¹⁰⁰¹ "Machinery and Labor." *Grange Visitor*, August 15, 1878, vol. 3, no. 6, p. 1; "Does Machinery Rob Labor." *Grange Visitor*, December 1, 1878, vol. 3, no. 23, p. 1.

evidently more interested in drawing lines which bound workers and farmers together against merchants and manufacturers than they were in drawing divisions between them.

Most hired workers did not participate in machine breaking and most farmers were far more interested in purchasing, using, and maintaining machines in the years that followed than they were in seeing them destroyed. Yet conflict between farmers and some hired workers did take place around machines and broader technological systems. In later decades, the conflict between farmers' cooperatives and machine manufacturers would reignite under the banner of new organizations.

Cooperatives Fight for Twine

Farmers turned to new organizations to assert some agency over the technological systems of industrial agriculture they built. They attempted to use the strategies that the Grange had previously employed in organizing cooperative agencies and stores. They reignited conflict with manufacturers and their agents but were hindered by the same difficulties in confronting the task of doing business in the economy of circulation that hindered the Grangers before them. In contrast to the Grangers, however, these cooperatives were shaped by the augmented state of technological systems. Their main successes were in cooperatively purchasing only one machine component; the twine used for self-binding harvesters. In focusing their efforts on a supplemental input in binder twine, farmers could only engage in the struggle as consumers.

Concerns about the cost of twine in the 1880s and 1890s reflected the same producerist and antimonopolist ideals that had animated the Granger movement of earlier decades.¹⁰⁰² The *Prairie Farmer* expressed concern about the cost of twine, “especially since it is pretty well understood that the proprietors of the twine-binder patents are all more or less pecuniarily interested in the manufacture of reaper twine.”¹⁰⁰³ Farmers were concerned also about the possibility of a “twine trust” that might control that material’s production.¹⁰⁰⁴ As farming people continued to confront their place in the political economy that surrounded the purchase of machines, they once again turned to cooperative organizations to assert their claims as producers and maintainers of mechanized farming.

Farmers built new cooperative organizations in the late 1880s and early 1890s, many of which purchased binder twine. In fact, some local and state Granges of the 1890s themselves attempted to purchase binder twine cooperatively, albeit on a smaller scale than the cooperative activity of the 1870s.¹⁰⁰⁵ But the Granges were accompanied by several new farmer’s organizations that rose to prominence in the late 1880s. Among these were the Farmers’ Alliances.¹⁰⁰⁶ Alliances included many familiar producerist and

¹⁰⁰² On changes in the price of binder twine, see, Ward, “Extensive Development of the Canadian Prairies,” 95.

¹⁰⁰³ “Our Champaign Letter.” *Prairie Farmer*, November 24, 1883, 745.

¹⁰⁰⁴ “Against the Binder Twine Trust.” *Prairie Farmer*, March 23, 1889, 177; “As to Binding Twine.” *Prairie Farmer*, June 9, 1894, 3; “The Binder Twine Market.” *Prairie Farmer*, June 10, 1899, 2.

¹⁰⁰⁵ Douglass, “The Ohio Grange,” 29; “White Hall Social Grange, No 1308, Minutes” (September 16, 1891), MS-BC688, Abraham Lincoln Presidential Library and Museum, 45-47, 51, 110-111.

¹⁰⁰⁶ William F. Holmes, “Populism: In Search of Context,” *Agricultural History* 64, no. 4 (1990): 26–58, remains among the most comprehensive treatments of the rich historiography of the Farmers’ Alliances and Populist movements throughout the country; Charles Postel, “Populism as a Concept and the Challenge of U.S. History,” *Ideas: Idées d’Amérique* 14 (2019): 1–16, provides a more recent treatment of the

antimonopolist sentiments in their formative statements, including an opposition to the high cost of everything from self-binders to sewing machines.¹⁰⁰⁷ Alliances were largely organized under either the National Farmers' Alliance based in Chicago—often called the Northern Alliance—or the under the organization that would come to be known as the National Farmers' Alliance and Industrial Union—often called the Southern Alliance. Unlike the Granger movement, which had been strongest in the eastern Midwestern states like Illinois and Indiana, Northern Alliance activity was strongest further west in the prairie states like Nebraska, Kansas, and the Dakotas—all of which saw continued U.S. settlement in the later decades of the century. The Alliances also took on greater prominence in party politics as the organizations out of which the People's Party would emerge and eventually take part in local, state, and national elections in the 1890s.¹⁰⁰⁸

historiography in the context of twenty-first century invocations of the term “populism”; Formative works that explore American Populism and the Farmers' Alliances as the efforts of small-producers to either challenge the growth of corporate capitalism, or adapt it to their own interests include, Hicks, *Populist Revolt*; Hofstadter, *The Age of Reform*; Pollack, *The Populist Response to Industrial America*; Goodwyn, *Democratic Promise*; Steven Hahn, *The Roots of Southern Populism: Yeoman Farmers and the Transformation of the Georgia Upcountry, 1850-1890* (New York: Oxford University Press, 1983); Postel, *The Populist Vision*. The National Farmers' Alliance, or “Northern Alliance,” features less prominently in this historiography than the “Southern” Alliances, in part because, as Holmes, 37-38, discusses, the concerns of Populists and Alliance members were informed by the relationship between the “peripheral” areas of the American South and West and the “core” regions of the Northeast. The Great Lakes and eastern-most Midwestern states do not fit neatly into that story of regional opposition. For Alliance activity in states that I consider as Midwestern, see, Roy V. Scott, “Milton George and the Farmers' Alliance Movement,” *The Mississippi Valley Historical Review* 45, no. 1 (June 1958): 90–109; Peter H. Argersinger, *The Limits of Agrarian Radicalism: Western Populism and American Politics* (Lawrence: University of Kansas Press, 1995); Ostler, *Prairie Populism*; Jane Taylor Nelsen, “Afterward,” in Kellie, *A Prairie Populist*, 147-172; Slez, *The Making of the Populist Movement*.

¹⁰⁰⁷ “Why Farmers Should Organize,” *Western Rural*, April 17, 1880, 124; “Politics and the Farmers' Convention,” *Western Rural*, September 18, 1880, 360; “Sewing Machine Extortion,” *Prairie Farmer*, April 23, 1887, 268.

¹⁰⁰⁸ “Political Parties and the Alliance Question,” *Western Rural*, April 17, 1880, 124; “That New Party,” *Western Rural*, November 26, 1881, 377; “The Alliance and New Party,” *Western Rural*, January 21, 1882, 20.

Some farmers saw a solution to the twine problem in the production of twine by state prisoners. Some members of the Farmers' Alliances took up this cause. These included James Witham, who wrote of the project in his political memoir.¹⁰⁰⁹ Several states considered plans to have state prisoners manufacture binder twine, and Alliance newspapers reported on the plans favorably.¹⁰¹⁰ Yet the prison production of twine was not the Alliances' central strategy and was driven primarily by other interests.¹⁰¹¹

The Alliances focused more of their efforts regarding binder twine on economic cooperation. Cooperative purchasing of farm goods became a focus of their efforts, and the Southern Alliances had particular, if short-lived, successes in building cooperative exchanges.¹⁰¹² One of those "Southern" Alliances was actually in Kansas, and the state of Kansas saw an early emphasis on the building of cooperative stores by local Alliances in the late 1880s. In the early 1890s, the Kansas Alliance also built a short-lived statewide exchange that did a fairly extensive business with livestock and binder twine.¹⁰¹³ The Alliance of Dakota Territory was also started in the 1880s with the founding of cooperatives as its central goal. Local Alliances in both North and South Dakota had

¹⁰⁰⁹ Witham, 63.

¹⁰¹⁰ "Grain Harvesters and Binders." *Prairie Farmer*, April 20, 1889, 249; "Wisconsin State Grange." *Prairie Farmer*, December 20, 1890, 301; "Twine Factory for Iowa." *Prairie Farmer*, May 6, 1899, 16.

¹⁰¹¹ Evans, *Bound in Twine*, 121-160.

¹⁰¹² For the Southern exchanges, see Goodwyn, *Democratic Promise*; Postel, *The Populist Vision*. Alliances in Midwestern states pursued cooperative purchasing on a smaller scale than the Southern exchanges and also on a smaller scale than the Midwestern Grangers had in the 1870s. The National Farmers' Alliance or "Northern" Alliance attempted to build an "economy club," largely for the purpose of cooperating on the sale of produce, in the mid-1880s, but it was not long-lived. See, Scott, *Milton George and the Farmers' Alliance Movement*, 103-104.

¹⁰¹³ Robert C. McMath Jr., "Preface to Populism: The Origin and Economic Development of the Southern Farmers' Alliance in Kansas," *Kansas Historical Quarterly* 42, no. 1 (1976): 55-65.

some limited success purchasing machines cooperatively, and a territory-wide Alliance Company served as a business agency for both the North Dakota and South Dakota Alliances after 1889. The North Dakota Alliance even left the Northern Alliance to join the Southern Alliance with Kansas, which shared its focus on cooperation.¹⁰¹⁴ Some state Alliances of the Northern Alliance built state business agencies and local cooperative stores as well. The Nebraska Farmers' Alliance, for instance, established a state business agency in 1890 that continued for several years.¹⁰¹⁵ Members contacted the Nebraska Alliance about purchasing sewing machines, washing machines, and mowers.¹⁰¹⁶ The business they did in machines was likely limited to smaller machines like sewing machines, but the extent of the business the exchanges did in even those machines is unclear.¹⁰¹⁷

¹⁰¹⁴ Glenn L. Brudvig, "The Farmers' Alliance and Populist Movement in North Dakota, 1884-1896" (Grand Forks, University of North Dakota, 1956), 1-100. For a particular example of the success of a North Dakota local Alliance in Whiteside in purchasing self-binders, see Brudvig, 45-46. For operations of the territory-wide business agency, see Brudvig, 76-85.

¹⁰¹⁵ "The State Agency at Lincoln." *Farmers' Alliance*. March 1, 1890, 2. Nebraska Newspapers. <https://nebnewspapers.unl.edu/lccn/2017270209/>; Editorial. "The State Agent." *Farmers' Alliance*, March 22, 1890, 2; "Our State Agency." *Farmers' Alliance*, April 19, 1890, 2; "The Alliance Business Agency." *Farmers' Alliance*, May 17, 1890, 2; "Nebraska State Alliance." *Farmers' Alliance*, August 23, 1890, 2; "The Alliance State Agency." *Farmers' Alliance*, April 23, 1891, 4; "Alliance State Business Agency." *Alliance-Independent*, April 13, 1893, 7.

¹⁰¹⁶ W. F. Brandt to Sect. State Alliance (Luna A. Kellie), February 18, 1894, RG2623.AM, Microfilm, Reel 1, Frame 382-384, Nebraska Farmers' Alliance papers, Nebraska State Historical Society; John D. Murphy to Mrs. J. T. Kellie, July 4, 1895, RG2623.AM, Microfilm, Reel 2, Frame 1572-1573, Nebraska Farmers' Alliance papers, Nebraska State Historical Society; R. A. Southworth to Sister Kellie (Luna A. Kellie), March 10, 1896, RG2623.AM, Microfilm, Reel 2, Frame 1810-1811, Nebraska Farmers' Alliance papers, Nebraska State Historical Society.

¹⁰¹⁷ Alliance state business agency advertisements in Nebraska featured those smaller items far more frequently. Mentions of machinery are limited to instructions to write into the state agent for prices and information on machinery. See, "State Alliance Business Agency Can Furnish Anything Needed on the Farm." *Farmers' Alliance*, August 23, 1890, 2; "Alliance State Business Agency." *Farmers' Alliance* August 27, 1891, 7; "Alliance State Business Agency." *Farmers' Alliance*, September 17, 1891, 3.

In addition to the efforts of the Alliances, some Midwestern farmers formed different organizations that asserted their claims as producers of mechanized agriculture. The Iowa Farmer's Protective Association was active in the 1880s before joining with the Iowa Alliance.¹⁰¹⁸ The Patrons of Industry operated as a political organization for both farmers and laborers largely in Michigan and Wisconsin and were accompanied by a Canadian organization of the same name.¹⁰¹⁹ The Farmers' Mutual Benefit Association operated in Southern Illinois and surrounding areas. The F.M.B.A. began with efforts at cooperative buying and selling and employed many of the old Grange strategies of appointing purchasing agents and founding cooperative stores on the Rochdale plan. The Association also worked with local merchants through a contract system when able.¹⁰²⁰

Alliance and other cooperative efforts to purchase binder twine reflected their context in a world of more complicated machines that involved more supplemental parts. Twine was perhaps the most essential supplemental part needed for the machines of these decades. As such, farmer's organizations turned to twine production schemes and cooperative purchasing efforts.¹⁰²¹ The Nebraska state agency evidently had some success in securing binder twine at lower prices for its members in 1890.¹⁰²² In 1895, the

¹⁰¹⁸ "Iowa Farmer's Protective Association," *Western Rural*, March 11, 1882, 74; Louis Bernard Schmidt, "The Farmers' Alliance," *Palimpsest* 31, no. 4 (1950): 136.

¹⁰¹⁹ W. H. Smith. "Patrons of Industry." In Emory A. Allen, *Labor and Capital* (Copyright by S. C. Ferguson, E. A. Allen, and W. H. Ferguson, 1891), 469-476.

¹⁰²⁰ John P. Stelle. "The Farmers' Mutual Benefit Association." In Allen, *Labor and Capital*, 409-425; Roy V. Scott, "The Rise of the Farmers' Mutual Benefit Association in Illinois, 1883-1891," *Agricultural History* 32, no. 1 (January 1958): 44-55.

¹⁰²¹ "Iowa Farmer's Protective Association," *Western Rural*, March 11, 1882, 74.

¹⁰²² "Binder Twine." *Farmers' Alliance*, April 19, 1890, 2; "Our Twine Deal and the State Agency." *Farmers' Alliance*, June 28, 1890, 2; "The State Agency Twine Deal." *Farmers' Alliance*, August 9, 1890, 2.

state agent of the Iowa State Farmers' Alliance also claimed the ability to furnish binder twine not only to Alliance members in Iowa but to those in other states as well.¹⁰²³ Locals of the F.M.B.A. made smaller contracts for binder twine with local merchants.¹⁰²⁴ The Kansas state exchange likely did its largest business in binder twine. The state Alliance president claimed that the state exchange had saved farmers \$300,000 in one item alone, likely referring to twine.¹⁰²⁵ The Dakota Alliances also emphasized twine in their cooperative efforts. In fact, the North Dakota Alliance went as far as to attempt to establish an Alliance manufacturing operation for twine, though the plans never came to fruition.¹⁰²⁶

Alliances also turned to boycotts to pressure manufacturers to lower twine prices. When Alliance farmers threatened to boycott machines, they referenced twine costs as much as the excessive prices of machines themselves. One farmer encouraged others to stay resolutely dedicated to the maintenance of their own machines and “not be in any hurry to buy new machines” in order to get better terms.¹⁰²⁷ Yet farmers were more likely to turn their attention to binder twine in their statements on avoiding new purchases. Local Alliances passed resolutions to forego the use of twine for the harvest unless manufacturers approached them with better prices.¹⁰²⁸

¹⁰²³ F. R. Brackney to Mrs. J. T. Kellie, February 28, 1895, RG2623.AM, Microfilm, Reel 2, Frame 1293, Nebraska Farmers' Alliance papers, Nebraska State Historical Society.

¹⁰²⁴ *Albion Journal*, June 6, 1889, Vol. 20, No. 46, p. 1.

<https://idnc.library.illinois.edu/?a=cl&cl=CL1&sp=TAJ&e=-----en-20-TAJ-1--img-txIN----->.

¹⁰²⁵ McMath Jr., 62.

¹⁰²⁶ Brudvig, 82, 84-85.

¹⁰²⁷ J. M. Gale. “The Harvester Combine.” *Prairie Farmer*, January 17, 1891, 41.

¹⁰²⁸ “Sunnyside Farmers' Alliance No. 709.” *Kansas Farmer*, April 11, 1889, 7. Newspapers.com. <https://newscomwc.newspapers.com/paper/kansas-farmer/2950/>.

Twine was a topic of conversation within local Alliances as well, as farmers continued to cultivate knowledge of the components of their technological systems, but conversations about twine reflect the extent to which farmers were becoming consumers, rather than producers, in the context of mechanized agriculture. They now discussed twine not with the objective of knowing how to use and maintain their machines, but simply to make the best purchases for the best prices. Local Alliances in Nebraska wrote to the state Alliance in 1894 requesting price lists and samples of twine. They also requested samples of different types of twine.¹⁰²⁹ In Illinois, the Alliance of Henry County dedicated much of its cooperative work to the purchase of binder twine. Members of this local Alliance discussed the cooperative purchase of twine on a number of occasions in 1890 and 1891. Their discussions included prices, merchants that had offered to do business with them, and which type of twine would best serve their needs. On June 19th, 1890, the Alliance decided to purchase hemp twine, but after further discussion on June 25th, they instead decided to purchase manilla twine.¹⁰³⁰ Such discussions likely did lead to cost-savings as farmers found alternative sources of binder

¹⁰²⁹ W. A. Bates to Mrs. J. T. Kellie (Luna A. Kellie), May 12, 1894, RG2623.AM, Microfilm, Reel 1, Frame 701-703, Nebraska Farmers' Alliance papers, Nebraska State Historical Society; W. A. Bates to Mrs. J. T. Kellie (Luna A. Kellie), May 22, 1894, RG2623.AM, Microfilm, Reel 1, Frame 756-757, Nebraska Farmers' Alliance papers, Nebraska State Historical Society; Franklin Taylor to Mrs. J. T. Kellie (Luna A. Kellie), June 6, 1894, RG2623.AM, Microfilm, Reel 1, Frame 847-849, Nebraska Farmers' Alliance papers, Nebraska State Historical Society; A. F. Johnson to Mrs. J. T. Kellie (Luna A. Kellie), May 27, 1896, RG2623.AM, Microfilm, Reel 2, Frame 1872, Nebraska Farmers' Alliance papers, Nebraska State Historical Society; E. Loderman to Mrs. J. T. Kellie (Luna A. Kellie), June 8, 1896, RG2623.AM, Microfilm, Reel 2, Frame 1886-1888, Nebraska Farmers' Alliance papers, Nebraska State Historical Society.

¹⁰³⁰ "Minutes, National Farmers' Alliance and Industrial Union (Henry County, Ill)" (1890-1891), SC 2283, Abraham Lincoln Presidential Library and Museum, see the following dates within: June 19th, 1890, June 25th, 1890, January 22, 1891, and June 11, 1891.

twine apart from machine manufacturers themselves. Nevertheless, the decision to go with one type over another was as far as the local Alliance's agency over this new component of technological systems could extend when using complex machines that required inputs like twine.

While the extent to which Alliance efforts turned to the purchase of binder twine shows that farmers were aware of their need to apply cooperative efforts to a world of machines with supplemental needs like twine, it also shows their limitations. Overall, the Alliances seem to have been less successful than the Granges in negotiating for lower prices and their cooperative organizations were likewise short-lived. Alliance cooperatives were part of a struggle over who could claim the mantle as the producers of, and authorities over, the mechanical systems of grain farming at the end of the nineteenth century. Through those cooperatives, farmers continued to assert their rights to agency over industrial agriculture, but their ability to do so as producers was diminished.

Alternative Methods of Purchasing

While the Alliances and other cooperatives struggled to provide an alternative source of machines for farmers that would allow them some independence from manufacturers and their agents, farmers also found other alternatives ways to purchase machines. A market in second-hand machines appeared in some places and farming people were able to purchase machines from one another and from small repair shops.

Nevertheless, these second-hand markets relied heavily on machine maintenance, which was a limitation because manufacturers' control over machine parts and maintenance simultaneously increased.

Farmers' desires to buy and sell used machines is apparent even in the records of machine companies. Some farmers sought to trade old machines in for new ones at a discount, as some sewing machine companies already encouraged their customers to do.¹⁰³¹ One McCormick agent reported that "the whole country is full of old machines" and that many farmers were "offering to trade for anything."¹⁰³² The McCormick company did not institute a trade-in or buy-back program, however, because its dominance enabled the company to sell only new models each year. Other machine companies did, however, institute such programs.¹⁰³³ Ontario farmer Duncan MacFarlane traded in an old mower for a new one in 1886. He later did so again, when he went to purchase his first self-binding harvester later that year.¹⁰³⁴ Nevertheless, most farmers did not sell their machines back to machine company agents.

The purchase of machines second-hand from other farmers offered another method to avoid purchasing from manufacturers. Farming people bought reapers, mowers, threshers, and sewing machines second-hand from one another.¹⁰³⁵ Luna

¹⁰³¹ Brandon, 118-119.

¹⁰³² I. N. Van Hoesen to Cyrus Hall McCormick, March 18, 1872, McCormick Mss 1A, Box 47, C.H.M. Correspondence.

¹⁰³³ John Edgar to Cyrus Hall McCormick and Leander J. McCormick, October 28, 1874, McCormick Mss 1A, Box 53, C.H.M. Correspondence.

¹⁰³⁴ Duncan MacFarlane, "Diary," (June 24, 1886); Duncan MacFarlane, "Diary," (September 1, 1886).

¹⁰³⁵ Alice Corless Treffry, "Diary and Transcription" (1900-1901), September 25, 1900, Norwich and District Archives, via Rural Diary Archive. <https://ruraldiaries.lib.uoguelph.ca/transcribe/items/show/206>; Lorenzo Dow Brown, "Journal Transcriptions," August 11, 1876, p. 67, Box 4, Folder 2; Lorenzo Dow

Kellie's family even bought a Marsh harvester from a neighbor in the 1870s.¹⁰³⁶ Purchasing from other farmers could also allow for more flexibility. Andrew Peterson bought an "old Wood's reaper from Bernard Kaphold," in 1883, but returned it only a few days later and got another one from someone else. Such arrangements were dependent on the repair abilities of farmers, however, as Peterson then spent a few days tinkering with the machine and fixing it back into working shape.¹⁰³⁷ Warren Clark seems to have purchased a sewing machine for his wife from a neighbor, and another family received an old sewing machine as a Christmas gift, and they made that work for the sewing of the whole family.¹⁰³⁸ Machine knowledge, and sometimes local solidarity, allowed rural people to take advantage of the fact that machines were common in these decades and to avoid purchasing on credit.

Some shops took the trade in second-hand machines to be a part of their daily business. Wagon-makers M. and J. Kappel, for instance, ran an advertisement for a "second hand Wood's reaper, in good repair."¹⁰³⁹ Whether the Kappels did any maintenance to the second-hand machine before selling it is unknown, but likely. Other small retailers of second-hand machines certainly did. Witney's commission store, of Red Wing, Minnesota, offered to repair old sewing machines and sell them on a ten percent

Brown, "Journal Transcriptions," August 16, 1881, p. 133, Box 4, Folder 7; Pond, "Diary," (1889), cash account, October 1889.

¹⁰³⁶ Kellie, *A Prairie Populist*, 82-86.

¹⁰³⁷ Peterson, "Diary," July 26, 1883, p. 518; Peterson, "Diary," July 31, 1883, p. 519; Peterson, "Diary," August 3-4, 1883, p. 519.

¹⁰³⁸ Clark, *Rain Follows the Plow*, 133; Lynus A. Kibbe, "Early Recollections of the Son of a Pioneer Newspaper Man of South Dakota and Dakota Territory," in *South Dakota Historical Collections*, vol. 25 (Pierre: South Dakota State Historical Society, 1951), 331.

¹⁰³⁹ "Reaper for Sale." *Grange Advance*, August 4, 1875, 3.

commission.¹⁰⁴⁰ These town enterprises thus contributed to a market for machine repair and purchase that manufacturers did not control.

This exchange of second-hand machines, however, was naturally dependent on the ability of farming people to keep machines around for some time. The maintenance practices they had developed over the past decades were essential in doing so. Yet farmers' dependence on manufacturers for parts and manufacturers' strategies of placing maintenance further under the purview of their own agents undermined their ability to independently maintain their technological systems.

Maintaining Complicated Machines

Machine maintenance remained important not only to the efforts of farming people to purchase and use old machines, but also to daily machine use on the farm. Farming people continued to promote the virtue of prudent maintenance as well as to perform maintenance and repair tasks. But the increased complexity of machines and the number of new, and often metal, parts that were involved in the large machines of the latter decades of the century—especially self-binders—contributed to farmers' difficulties in maintaining machines without significant help from manufacturers' agents.

Agricultural newspapers continued to valorize the proper maintenance of machinery as a necessary prerequisite to farmers' claims as the producers of mechanized

¹⁰⁴⁰ "How to make money these hard times!" *Grange Advance*, May 2, 1877, 1.

agriculture. One contributor to the *Western Rural* advised that farmers never purchase “any tool for which one cannot provide shelter, and a coat of paint,” and boasted that he had kept his Champion mowing machine running for sixteen years.¹⁰⁴¹ The ability and dedication to keep the machine going for so long served as a mark of the farmer’s prudence as well as of his claims as a producer. Another article connected the farmers’ dedication to machine maintenance to progress itself, stating that proper knowledge and repair practices would guarantee that “the march of civilization and progress will go on.”¹⁰⁴² Maintenance thus continued to hold an important ideological place in discussions of farmers’ contributions to the industrialization of agriculture.

These same articles that valorized maintenance as a task which undergirded farmers’ claims as producers also often contained useful information about how farmers could perform that task. One article for the *Prairie Farmer* included the instructions: “to clean iron and steel remove all dirt by scraping and washing, and in a day or so rub with dry sand, and apply to the iron a coat of beeswax and rosin, in the proportion of four parts rosin to one of beeswax, melted together.”¹⁰⁴³ Another article that asserted the necessity of oiling machines properly also offered instructions for the job.¹⁰⁴⁴ Still others asserted the importance of storing machines indoors and gave instructions on how to build a machine shed as well as how to paint both machines and their sheds.¹⁰⁴⁵ Some of these

¹⁰⁴¹ “Care of Farm Tools.” *Western Rural*, August 19, 1893, p. 514.

¹⁰⁴² “Economy in the Preservation of Tools.” *Western Rural*, January 10, 1885, 18.

¹⁰⁴³ *Prairie Farmer*, October 14, 1882. Pg. 1

¹⁰⁴⁴ “Harvesting Wheat,” *Prairie Farmer*, June 11, 1898, 1.

¹⁰⁴⁵ “Sheds for Farm Machinery.” *Prairie Farmer*, November 11, 1899, 1; “Sheds for Farm Machinery.” *Prairie Farmer*, December 16, 1899, 2; “Gather up the Machinery.” *Prairie Farmer*, October 30, 1897, 4.

articles were written by farmers themselves.¹⁰⁴⁶ Many farming people either took this advice seriously, or were already aware of ways to care for machines from past experience.

Routine maintenance practices kept systems of mechanized agriculture going, but such practices now placed greater demands on farmers. They continued to take the time to set up machines—including the seed drills and self-binding harvesters that had become more common.¹⁰⁴⁷ Some of that process involved doing specific repairs before use, but many other parts of the process can be subsumed under the general category of “rigging.”¹⁰⁴⁸ Farming people also had to create spaces to store large machines like self-binders.¹⁰⁴⁹ In the later decades of the nineteenth century, storage practices were aided by the availability of new devices, often made available by machine manufacturers themselves, for machine storage, including machine tents, thresher covers, and binder

¹⁰⁴⁶ “Winter Care of Farm Tools.” *Rural Home* (Virgil, Kansas), February 15, 1898, Vol. 1, No. 3, 27. Newspapers.com. <https://newscomwc.newspapers.com/paper/rural-home/10829/>.

¹⁰⁴⁷ Barrick, “Diaries,” (March 31, 1899).

¹⁰⁴⁸ William Sunter, “1893 Diary Transcripts” (1893), August 1, 1893, William Sunter Diary Collection, Archives and Special Collections, University of Guelph, via Rural Diary Archive; Pond, “Diary,” (1881), June 20, 1881, Box 1, Folder 2; Rollins, “Diary,” July 27-28, 1877; Rollins, “Diary,” July 23, 1878; Rollins, “Diary,” July 25, 1879; Cummins, “Diary,” July 5, 1882, Reel 1, Frame 2273; Cummins, “Diary,” (August 9, 1882), Reel 1, Frame 2282; Cummins, “Diary,” June 26, 1883, Reel 1, Frame 2365; Peterson, “Diary,” July 27, 1876, M231, Reel 2; Barrick, “Diaries,” August 1, 1908; Elam, “Diaries,” June 26, 1889; Elam, “Diaries,” July 6, 1899; Vawter, “Diaries,” June 29, 1885, M957; John Campbell Bailey, “Diary” (1883), July 28, 1883, p. 38, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum; Henry A. Griswold, “Diary, January 1897-December 1907” (1897-1907), June 20, 1899, p. 62, MS-BC260, Box 1, Henry A. Griswold papers, Abraham Lincoln Presidential Library and Museum.

¹⁰⁴⁹ Henry Pond, “Diary” (1893), July 4, 1893, M0751, Box 1, Folder 6, Henry Pond Papers, Indiana Historical Society; Woodward, *The Checkered Years*, 189; Henry A. Griswold, “Diary, January 1885-December 1896” (1896 1885), July 10, 1894, p. 230, MS-BC260, Box 1, Henry A. Griswold papers, Abraham Lincoln Presidential Library and Museum.

covers.¹⁰⁵⁰ To store machines that remained on the farm, however, most farmers' best option was a stand-alone machine shed, especially as the larger machines of these decades could not simply be accommodated in extra barn space as smaller machines had been in the 1850s and 1860s.¹⁰⁵¹

Farming people also continued to transport machines to and from neighbors' farms as they shared and hired out machines and had to take care in doing so.¹⁰⁵² They might, as William Wilson had to in 1888, find an accommodating neighbor's barn to store the machine in overnight in preparation for later transport.¹⁰⁵³ A delay in the transportation of a machine could delay the start of time-sensitive labor.¹⁰⁵⁴

Transportation itself was sometimes a paid service between farming people.¹⁰⁵⁵

Breakages in transportation could happen as well. For instance, Ontario farmer James Carpenter received a machine that was damaged in transport, and he had to set about

¹⁰⁵⁰ "Mower Knives, Harvester Sickles, Mower and Reaper Sections, Twist Drills" (Whitman and Barnes Manufacturing Co., 1894), Item ID: 08061880, Hagley Library, Trade Catalogs, 155-158; "Harvester, Binder and Separator Covers." *Prairie Farmer*, June 11, 1887; Buttles, August 12, 1895, Reel 5.

¹⁰⁵¹ Charles E. Hill, "Diary" (1888), July 24, 1888, RG0940, Charles E. Hill Diaries, 1878-1889, Nebraska State Historical Society; Cummins, "Diary," September 7, 1883, Reel 1, Frame 2383; Cotterman, "Diary," July 6, 1889, Box 1, Folder 3; William Wilson, "Diaries, Volume Two," July 8, 1885, 75; Samuel Carpenter, "Diary" (1898), July 19, 1898, SC 2130, Samuel Carpenter Diaries, Abraham Lincoln Presidential Library. For newspaper articles on the importance of storage, specifically, see "How to Ruin Machinery." *The Rural Home* (Lawrence, Kansas), October 1899, Vol. 1, No. 8, 2.

¹⁰⁵² Elam, "Diary," July 5, 1899; William Wilson, "Diaries, Volume Five," July 7, 1893, p. 40; William Wilson, "Diaries, Volume Six," July 3-5, 1894, p. 2-3.

¹⁰⁵³ William Wilson, "Diaries, Volume Three," (1887-1889), July 21, 1887, V156, William Wilson Diaries, Indiana State Library, p. 14.

¹⁰⁵⁴ Buttles, September 14, 1882, Reel 4, shows this to be the case when a shared thresher arrived late; Delays in wider transportation systems, however, could delay machines from getting from manufacturers to their agents and then out to farmers when expected. See, for instance, Lydia Vinton, "Diaries," March 17, 1884.

¹⁰⁵⁵ James Carpenter, "Diary," November 24, 1884.

getting it right.¹⁰⁵⁶ There were also new devices to help in the transportation of larger and heavier machines like self-binding harvesters. Farmers bought special trucks for the transportation of their binders and managing these binder trucks became a time-consuming task in itself.¹⁰⁵⁷ Farming people continued to make these and other tasks part of their maintenance practices, even as doing so required more in terms of expertise, care, and supplies.

Farming people relied on their social systems of labor organization to assist one another in repairs, but local tradesmen could not provide all repair services required for new machines. Local blacksmiths offered a source for machine repair knowledge closer to rural communities.¹⁰⁵⁸ The *American Blacksmith* occasionally mentioned farm machine repairs as part of the business of blacksmithing in rural areas.¹⁰⁵⁹ Blacksmiths also had to deal with a world of new types of parts, not only in their machine work, but in their more-typical lines of work like wagon repairs, because “spring making, repairing, and tempering” was an essential part of both binder and wagon work.¹⁰⁶⁰ Some farmers

¹⁰⁵⁶ James Carpenter, “Diary,” June 21-23, 1884.

¹⁰⁵⁷ Michie, “Self Doing Naught,” January 5, 1893; Vawter, “Diaries,” June 26, 1913, M 957; Walter A. Wood Mowing and Reaping Machine Co., “Price List of Parts of Walter A. Wood Harvesting Machines with Changes in Prices, and New Telegraph Cipher for Machines and Parts” (Hoosick Falls, NY, 1889); “Novel Binder Transport.” *Western Rural*, May 3, 1894, 275.

¹⁰⁵⁸ Russell, “Diary,” November 5, 1896, p. 524.

¹⁰⁵⁹ “The Blacksmith’s Work as it Goes in Kansas.” *American Blacksmith*, vol. 2, no. 7. April 1903, 125
Linda Hall Library.

https://catalog.lindahall.org/discovery/fulldisplay?docid=alma993112733405961&context=L&vid=01LIN DAHALL_INST:LHL&lang=en&search_scope=MyInstitution&adaptor=Local%20Search%20Engine&tab=LibraryCatalog&query=any,contains,American%20Blacksmith&offset=0; “What is your Side Line?”

American Blacksmith, vol 4. No. 4, February 1905, 71.

¹⁰⁶⁰ “Report on Springs and Spring Making.” *American Blacksmith*, vol. 2, no. 1, October 1902, 11; “Spring Making, Repairing and Tempering,” *American Blacksmith*, vol. 4., no. 1, October 1904, 11; *American Blacksmith*, vol. 4, no. 2, November 1904, 40.

moved away from doing their repairs with blacksmiths. James Carpenter, for instance, frequently visited his local blacksmith for other types of repairs, but went into town for reaper repairs, likely for help from the machine company.¹⁰⁶¹ While blacksmiths could be perform farm machine repair work, they were not the principal source for most farming families, nor does machine repair seem to have been the principal source of most blacksmith's labors, especially in the later decades of the century.¹⁰⁶²

Other independent repairers offered their services for the maintenance of sewing machines. A man named J. L. Hastings offered his services out of Red Wing, Minnesota, as a “worker in iron, brass and other metals” to repair sewing machines and make them “as good as new machines.”¹⁰⁶³ Minnesota farm woman, Lydia Vinton, accepted the services offered by another handyman who showed up on her door offering to repair and maintain sewing machines. Vinton paid one dollar for these services.¹⁰⁶⁴ Small operations like these may have originated in towns, but they clearly reached into the countryside as well.¹⁰⁶⁵ These local repair services constituted a source of maintainers on whom farming people sometimes relied. Their work may explain part of the reason that sewing machine

¹⁰⁶¹ James Carpenter, “Diary,” December 13, 1884.

¹⁰⁶² Borg, *Auto Mechanics*, 35-52, has demonstrates that while some rural blacksmiths did repair work with automobiles in the early twentieth century, the transition from blacksmithing to auto mechanic work was not the norm. In the late nineteenth century, blacksmiths similarly undertook farm machine repairs—likely to a greater extent than they undertook auto repairs in later decades—but nevertheless did not often make their principal line of work, especially by the turn of the century.

¹⁰⁶³ Advertisement. “J. L. Hastings.” *Grange Advance*, November 1, 1876, 1.

¹⁰⁶⁴ Lydia Vinton, *Diaries*, November 16, 1895, p. 13.

¹⁰⁶⁵ For other independent sewing repair services, see, “Sewing Machine Repairs.” *Nebraska Independent*. January 18, 1900, 7. Nebraska Newspapers. <https://nebnewspapers.unl.edu/lccn/2017270209/>; “Ladies-Write Me for Sewing Machine Repairs.” *Kansas Farmer*, December 3, 1898, 814 (16).

manufacturers were less able to pursue the strategy of harvester manufacturers in which company experts were touted as the authoritative maintainers of machines.

Farming people also relied on the accumulated local and family knowledge of past decades of experience with machine work. Many farming people continued to seek out their neighbors, rather than professionals, for help with repairs. This often involved making a trip out to the neighbor's farm, sometimes with the machine in tow. Some farmers took on labor roles more central to the repairing of machines and could be sought out by friends and neighbors for this help.¹⁰⁶⁶ Some people, such as Lorenzo Dow Brown, even continued to offer sewing repairs for neighbors.¹⁰⁶⁷ Farming people still did some repairs without any help outside the family, however. Many farming families recorded instances of members of the immediate family repairing field and sewing machines after breakages and setting them right to run another day.¹⁰⁶⁸ By helping each other out with repairs and handling what they could on their own, farming people continued to build their maintenance practices in the 1880s and 1890s.

¹⁰⁶⁶ Henry Pond, "Diary" (1887), June 22, 1887, M0751, Box 1, Folder 5, Henry Pond Papers, Indiana Historical Society; Sunter, "1893 Diary," August 1, 1893; Cool and Cool, "Diary," September 13, 1880, 99; Cool and Cool, "Diary," June 22, 1881, 170. For more examples of farmers seeking out neighbors for repair help, see, William Wilson, "Diaries, Volume 6," June 27, 1898, p. 100; Brackett, "Journals, Volume Four," July 28, 1886, p. 137; Harman Cotterman, "Diary" (1893), June 28-July 3, 1893, M 1290, Box 1, Folder 5, Harman and Sarah Cotterman Diaries, 1875-1933, Indiana Historical Society. Box 1, Folder 5; Cotterman and McClause paid each other back by "changing work" for this activity. See, for instance, Cotterman, "Diary," (1889), July 10, 1889, Box 1, Folder 3.

¹⁰⁶⁷ Lorenzo Dow Brown, "Journal Transcriptions," October 19-20, 1878, Box 4, Folder 4, p. 87; Lorenzo Dow Brown, "Journal Transcriptions," November 3, 1878, Box 4, Folder 4, p. 92.

¹⁰⁶⁸ Elam, July 7, 1892; Elam, July 6, 1899; Elam, June 29, 1887; Sunter, "Diary," August 30, 1893; Michie, "Self Doing Naught," July 2, 1877; Michie, "Self Doing Naught," July 21, 1881; Michie, "Self Doing Naught," July 31, 1882; Michie, "Self Doing Naught," August 4, 1883; Michie, "Self Doing Naught," August 12, 1884; Michie, "Self Doing Naught," July 27, 1889; Miller, *Many Danes, Some Norwegians*, 137; Clark, *Rain Follows the Plow*, 183; William Wilson, "Diaries, Volume 3" July 6, 1889), p. 89.

Nevertheless, the increased complexity of machines made it more difficult for farmers to maintain them without depending on manufacturers. The trajectory of production within this industry included manufacturers' substitution of iron, and eventually, steel, parts for those which had been wooden.¹⁰⁶⁹ In a context in which carpentry skills were more common than metallurgical skills, this development meant that fewer farming people had the ability to completely alter parts.¹⁰⁷⁰ As much as they knew about machines, they became increasingly dependent on the manufacturers of metal parts.

In addition to manufacturers' substitution of metal for wooden parts, new machines were often composed of many more parts than the machines of the middle decades of the century. Newspaper articles on the importance of routine maintenance practices considered the complex parts that filled the machines of the 1880s and 1890s. Newspapers instructed farmers to protect the internal gearing of machines, as well as to look over the "cranks, pinions and parts which glide over one on the other."¹⁰⁷¹ Newspaper advice about oiling also reflected the reality of maintenance on these now more complicated machines. Some machines included special oiling holes in the machine, which existed to allow farmers to oil concealed parts of the machine. These

¹⁰⁶⁹ Winder, 19.

¹⁰⁷⁰ For examples of farming people exercising carpentry skills useful in machine maintenance, see, Carver Simpson, "Diary" (1881-1882), August 2, 1881, Carver Simpson Diary Collections, Dufferin County Museum and Archive, via Rural Diary Archive.

<https://ruraldiaries.lib.uoguelph.ca/transcribe/collections/show/7>; James Carpenter, "Diary," August 21, 1883; James Carpenter, "Diary," January 3, 1883; Peterson, "Diary," June 26, 1888, pg. 707.

¹⁰⁷¹ "Harvest and Harvest Machinery." *Prairie Farmer*, May 11, 1889, 304; "Gather up the Machinery." *Prairie Farmer*, October 30, 1897, 4.

holes, however, could get “gummed up” even if machines were oiled regularly.¹⁰⁷² The consequences of inadequate oiling were also more severe for machines with more moving parts.¹⁰⁷³ Machine complexity thus only heightened the importance of maintenance practices which required inputs like machine oil.

The increased complexity of machines affected the ways in which farmers and machine companies responded to breakages as well. Some farmers managed to repair their reapers and even fabricate entire new parts, including platforms, for replacement on their reapers and mowers.¹⁰⁷⁴ But overall the parts involved in the care of self-binding harvesters were more numerous and specific than the reapers of earlier decades.¹⁰⁷⁵ By one account, self-binding harvesters included 3,800 distinct parts, while mowers and reapers only included several hundred.¹⁰⁷⁶ Farming people remembered the switch to binders as one that often involved some initial confusion at the intricacies of the machine. Frank Clampitt wrote this way of his first binder: “With so many new-fangled things all going at once it seemed at first very complicated and confusing.”¹⁰⁷⁷ Francis Jenkins likewise remembered that the farmers of his county struggled to get the first binders in

¹⁰⁷² “A Stitch in Time Saves Nine.” *Western Rural*, July 22, 1882, 229.

¹⁰⁷³ “Economy in the Preservation of Tools.” *Western Rural*, January 10, 1885, 18.

¹⁰⁷⁴ Buttlers, August 20, 1883, Reel 4.

¹⁰⁷⁵ Walter A. Wood Mowing and Reaping Machine Co., “Price List of Parts of Walter A. Wood Harvesting Machines with Changes in Prices, and New Telegraph Cipher for Machines and Parts” (Hoosick Falls, NY, 1889); Walter A. Wood Mowing and Reaping Machine Co., “Mowing and Reaping Machinery: Being the Forty-Ninth Annual Descriptive Catalogue of the Labor-Saving Mowers, Reapers, Harvesters and Binders, Hay Rakes, and Tedders” (Hoosick Falls, NY: The Company, 1901), Trade Cat .W8815, Hagley Library, Trade Catalogs; Warder, Bushnell and Glessner Co., “The Champion Binders, Reapers and Mowers” (Springfield, OH, c1899); Adriance, Platt and Co., “Adriance and Buckeye Harvesting Machinery,” 1895, Item ID: 08051223, Hagley Library, Trade Catalogs.

¹⁰⁷⁶ Herbert N. Casson, *Romance of the Reaper* (New York: Doubleday, Page and Co., 1908), 103.

¹⁰⁷⁷ Clampitt, 52.

their area running.¹⁰⁷⁸ In addition to, or perhaps because of, their complexity, binders did not always work right and sometimes required a little help from human labor binding and cutting to get the job done.¹⁰⁷⁹ Clifford Merrill Drury recalled that “should the binder fail to tie a knot, we knew how to twist a handful of straw so as to improvise a band strong enough to hold the bundle together.”¹⁰⁸⁰ A little ingenuity and hand labor allowed farming people to use their crop knowledge to improvise a way around the binders’ deficiency and continue producing the products of their systems of mechanized agriculture as well as the systems themselves. But if the device stopped working more consistently, the harvesters likely had to seek out a replacement part.

Farming people demonstrated some knowledge of the increased number and types of parts that made up the machines they used. When farming people encountered machine breakages, they often remarked on exactly what part of the machine had the problem. Threshermen wrote of the “gearing” that got jammed or broken inside their machines as well as “machine teeth.”¹⁰⁸¹ Farmers also wrote of specific parts of threshers as well.¹⁰⁸² Users of reapers, mowers, and binders recorded breakages of knotters, mainframes, chains, swallow tails, sickle drivers, trip hooks, drivers, tilters, and mail sills.¹⁰⁸³ Even

¹⁰⁷⁸ Jenkins, 46-49.

¹⁰⁷⁹ Miller, *Many Danes, Some Norwegians*, 141; Henry A. Griswold, “Diary, January 1885-December 1896,” June 14, 1895, p. 252. Vawter, “Diaries,” July 4, 1912, M 958; Henry A. Griswold, “Diary, January 1897-1907,” June 28-29, 1898, p. 38.

¹⁰⁸⁰ Drury, “Growing up on an Iowa Farm,” 128.

¹⁰⁸¹ Lorenzo Dow Brown, “Journal Transcriptions,” July 6, 1882, Box 5, Folder 1, p. 87; Russel, “Diary,” October 5, 1887, p. 310; Stein, “Diary,” October 19, 1879.

¹⁰⁸² Woodbury, Woodbury, and Woodbury, “Diary,” p. 314.

¹⁰⁸³ Michie, “Self Doing Naught,” August 13, 1886; Vawter, “Diaries,” August 1, 1885; Lorenzo Dow Brown, “Journal Transcriptions,” July 1, 1881, Box 4, Folder 7, p. 85; Pond, “Diary,” (1881), June 28, 1881, Box 1, Folder 2; Pond, “Diary,” (1883), July 3, 1883, Box 1, Folder 3; Henry Pond, “Diary” (1885),

purchasing the correct replacement parts required knowledge of those parts, as Harman Cotterman noted the rivets he purchased to mend his mowing knife in 1889.¹⁰⁸⁴ Some farmers cultivated knowledge of the complex machines and many parts that they relied on, even if they could not produce or repair those parts themselves.

Farmers' reliance on spare parts, however, increased their reliance on the structures of machine companies and their agents when it came to machine maintenance and repair. One type of part for binders that farming people had to begin dealing with were tension springs. These helped to allow the heavier harvesters to be pulled over uneven terrain without toppling or shaking the machine to its destruction. Occasionally, farmers like Harman Cotterman could fabricate new springs to replace those that broke.¹⁰⁸⁵ More often they had to go somewhere else to get a broken spring repaired or to get a new one.¹⁰⁸⁶ Some farm families also noted the specific parts of sewing machines that were broken when those machines needed repairs, such as when Lorenzo Dow Brown sought to repair his "sewing machine wheel" in 1878.¹⁰⁸⁷ Even though sewing

June 28, 1885, M0751, Box 1, Folder 4, Henry Pond Papers, Indiana Historical Society; Pond, "Diary" (1885), July 10, 1885, Box 1, Folder 4; Harman Cotterman, "Diary" (1891), June 29, 1891, M 1290, Box 1, Folder 4, Harman and Sarah Cotterman Diaries, 1875-1933, Indiana Historical Society; John Campbell Bailey, "Diary" (1882), July 19, 1882, p. 34 MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum; John Campbell Bailey, "Diary" (1891), July 18, 1891, p. 33, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum; John Campbell Bailey, "Diary" (1899), July 25, 1899, p. 36, MS-BC32, John Campbell Bailey Diaries, Abraham Lincoln Presidential Library and Museum; Henry A. Griswold, "Diary, January 1897-December 1907," June 28, 1898, p. 38.

¹⁰⁸⁴ Cotterman, "Diary," (1889), July 15, 1889, Box 1, Folder 3; See also, Michie, "Bookkeeping pages" in "Self Doing Naught," August 1886.

¹⁰⁸⁵ Harman Cotterman, "Diary" (1889), July 13, 1889, M 1290, Box 1, Folder 3, Harman and Sarah Cotterman Diaries, 1875-1933, Indiana Historical Society.

¹⁰⁸⁶ Cool and Cool, "Diary," July 7, 1884; Hill, "Diary," July 4, 1888; William Wilson, "Diaries, Volume 6," July 20, 1895, p. 51.

¹⁰⁸⁷ Lorenzo Dow Brown, "Journal Transcriptions," October 19, 1878, Box 4, Folder 4, p. 87.

machines did not see quite the augmented complexity that harvesting machines saw, the ability of farmers to identify and address their various parts seems to have increased in the final quarter of the century as well.

Even when farmers displayed intensive machine knowledge, they did so in ways that demonstrated their dependence on manufactured parts. Much of the maintenance work of the latter decades of the century revolved around putting replacement parts into machines. Clarence Vawter's repair process once involved disassembling the machine to put in a replacement part.¹⁰⁸⁸ Other cases could involve some fitting or filing of the parts. In any case, a fair amount of tinkering still had to take place on the farm even after farmers purchased the parts. Illinois farmer Samuel Carpenter, for instance, made several trips to town for repairs to his binder in the summer of 1898, and each time still had to spend mornings and afternoons afterwards tinkering with the binder until he could get it running.¹⁰⁸⁹ Occasionally, there was a permeable boundary between preparing a purchased part for the machine and fabricating the part itself into something else entirely so that it could be fit in. Indiana farmer, William Wilson, for instance, first recorded that he brought a replacement machine tongue to a neighbor in order to "finish" it. He crossed out the word "finish," however, and replaced it with the word "made."¹⁰⁹⁰ Evidently, Wilson considered the work he did on the replacement tongue to be something close to

¹⁰⁸⁸ Vawter, "Diaries," July 16, 1885.

¹⁰⁸⁹ Samuel Carpenter, "Diary" (1898), SC 2130, Samuel Carpenter Diaries, Abraham Lincoln Presidential Library, see dates June 18, June 26, June 27, July 13, July 14, and July 15, 1898.

¹⁰⁹⁰ William Wilson, "Diaries, Volume Two," August 1-3, 1885, p. 17.

creation. Nevertheless, this process was only possible after Wilson had purchased the necessary part from the manufacturer.

While farmers relied on many more replacement parts, the number of machines in rural communities did sometimes make it possible for farming people to pursue alternative strategies for securing repair parts. While farming people had scrapped old machines for parts to some degree in the middle decades of the century, the paucity of machines made this practice even more possible in its final decades. Ontario farmer George Michie recorded a visit from two neighbors who sought to obtain parts for an “old reaper” in the years after the reaper had been side-lined in favor of Michie’s new binder.¹⁰⁹¹ Whether the neighbors in question intended to use the parts to restore another old reaper, or to attempt to fix a binder of their own, is unknown. Either possibility would have required the farmers to rely on their own machine knowledge rather than help from machine companies. James Carpenter also recorded visiting his neighbor in pursuit of a “trip standard” for his reaper. His neighbor, Samuel Selman, did not have one, but instead directed Carpenter to his father’s house where Carpenter could “get one of them from another machine.”¹⁰⁹² Other farmers also took parts out of neighbors’ machines and used them as replacements in their own.¹⁰⁹³ Indiana farmer, William Wilson, even scrapped a

¹⁰⁹¹ Michie, “Self Doing Naught,” January 5, 1893; Michie, “Self Doing Naught,” July 17, 1894.

¹⁰⁹² James Carpenter, “Diary,” July 28, 1884.

¹⁰⁹³ Harman Cotterman, “Diary” (1894), July 6, 1894, M 1290, Box 1, Folder 5, Harman and Sarah Cotterman Diaries, 1875-1933, Indiana Historical Society; Woodbury, Woodbury, and Woodbury, “Diary,” 309.

neighbors machine to replace an entire self-binding attachment for a harvester.¹⁰⁹⁴ Due to the importance of binding attachments, Wilson's salvaging of the entire binder apparatus blurred the lines between obtaining entire machines second-hand and simply salvaging parts. It thus demonstrates the extent to which repair practices not only kept the systems of mechanized farming going, but also built those systems anew.

Nevertheless, the dependence of farming people on manufactured parts for the repair of larger machines like self-binding harvesters is apparent. Even as many farmers continued to know their machines intimately and comprehensively, they did not have the ability to furnish replacement parts on their own. It was in this context that farming people's command of the maintenance—and thus also, the production—of industrial agriculture diminished. Manufacturers and their agents embarked on a strategy to fill that space as a part of their strategies for the widespread introduction of self-binding harvesters: the employment of a new corps of machine “experts” to directly handle the set up and repair of complicated field machines.

The Professionalization of Machine Sale and Maintenance

The later years of the century saw not only the increased complexity and size of farm machines, but also of the corporate machinery that produced those machines.

Merchant dealers of machines sought to combine together under organizations to shape

¹⁰⁹⁴ William Wilson, “Diaries, Volume Six” (1894-1897), June 17, 1896, V156, William Wilson Diaries, Indiana State Library, p. 98.

the farm machine industry. Meanwhile, the size and organizational structures of leading manufacturing firms in the industry—including McCormick, Deering, J. I. Case, and Singer—grew during this era and these firms would become a part of the corporate transformation of American capitalism that occurred over the final decades of the century.¹⁰⁹⁵ A combination centered around Singer dominated the sewing machine industry throughout these decades.¹⁰⁹⁶ Eventually, corporate transformation would also include the merger of McCormick and Deering into the International Harvester Company with the backing of financier J. P. Morgan in 1902.¹⁰⁹⁷ Well before that, however, these companies grew and formalized their agency structures over the course of decades.¹⁰⁹⁸ In the late 1870s, they also hired greater numbers of, and drew more distinctions between, employees dedicated to machine maintenance. Manufacturers asserted their own agents and experts as the proper authorities in industrialized agriculture, and thus strengthened their control of it.

The many merchants who served as dealer-agents for machine manufacturers sought to consolidate their own control over the farm machine industry. These proprietors sold and repaired machines in small towns in rural areas. Stephen Collins, for instance,

¹⁰⁹⁵ Alfred D. Chandler Jr., *The Visible Hand*; Naomi R. Lamoreaux, *The Great Merger Movement in American Business, 1895-1904* (Cambridge: Cambridge University Press, 1985); Martin J. Sklar, *The Corporate Construction of American Capitalism, 1890-1916: The Market, The Law, and Politics* (Cambridge: Cambridge University Press, 1988); William G. Roy, *Socializing Capital*.

¹⁰⁹⁶ Brandon, 97-99; Bissell, *The First Conglomerate*, 83-89; Davies, *Peacefully Working to Conquer the World*, 22-27; Cooper, *The Sewing Machine*, 41-42; Godfrey, *An International History of the Sewing Machine*, 79-82.

¹⁰⁹⁷ Quick and Buchele, 147-158; Helen M. Kramer, "Harvesters and High Finance: Formation of the International Harvester Company," *Business History Review* 38, no. 3 (Autumn 1964): 283-301.

¹⁰⁹⁸ Winder, 45-52, 105-144; Zunz, 149-173.

sold a number of different types of machines including mowers, harvesters, threshers, and drills. His establishment was the biggest in Grand Forks and was presented impressively, but he was not the only farm machine dealer in town.¹⁰⁹⁹ These establishments could serve as agents for, and thus carry for sale, the products of multiple manufacturers from drills and harvesters to sewing machines.¹¹⁰⁰ Though they often only carried one line of any type of machine, these stores and their operators nonetheless occupied significant space in the farm machine industry and thus in the industrialization of grain agriculture.

In the final quarter of the century, dealer-agents asserted the primacy of their place within the industry and systems of mechanical agriculture as they began taking steps to separate themselves, their businesses, and their expertise from that of ordinary farmers. Trade papers like the *Farm Implement News*, established in 1882, sought to represent the interests of these dealer-agents. One of the first things on the agenda of *Farm Implement News* was to push farmer-agents who did only small amounts of business out of the trade, asserting that these farmers often only acted as agents to get a quick discount and were not up to the task.¹¹⁰¹ Conversely the editor considered “hardware men” to be excellent machine dealers.¹¹⁰² Merchants saw their interests as different from those of farmers, and looked to themselves and their fellows as the proper representatives and conduits of industrial agriculture.

¹⁰⁹⁹ “City of Grand Forks Illustrated, No 1728,” in *Western Americana* (New Haven: Research Publications, 1975).

¹¹⁰⁰ “Sewing Machine and Implement Dealers.” *Farm Implements News*, vol. 6, no. 10, September 1885, 6.

¹¹⁰¹ “Farmers Should Not Act as Agents.” *Farm Implement News*, vol 6, no. 5, May 1885, 10; “The Farmer Agent.” *Farm Implement News*, vol. 6, no. 6, June 1885, 3.

¹¹⁰² “Hardware Men as Agents.” *Farm Implement News*, vol. 6, no. 7, July 1885, 13.

Some farmers contested the claims of merchant dealers to authority over the sale of farm machines. One farmer-agent wrote in to disagree with the editor's opinion on farmer-agents. He argued that his experience as a farmer-agent in Maine, where machines were not as ubiquitous as they were in the Midwest, allowed locals to see and experience the machine in an environment they trusted.¹¹⁰³ The editor ran these objections without comment, but the *Farm Implement News* and its merchant-dealer readership continued to treat farmer-agents as a blight on the trade and a threat to their business.¹¹⁰⁴ One agent wrote in condemnation of farmer-agents supposedly pursuing the trade only to get discounts for themselves:

This, I claim, is unfair to the dealers. It cripples their business in a great measure and often brings them in such sharp competition that the handling of implements is of no benefit to them. I am not pleading for war profits, nor yet for monopoly in handling farm machinery, but I have had some experience in selling implements against farmer agents, whose only object was to secure one for their own use *at cost*. Now, if you want the name of every man who handles, or makes pretensions to handle, such goods, let me know and you shall have them.¹¹⁰⁵

Farmers and merchants thus disputed the question of who had the authority to serve as agents not just of manufacturers, but of industrial agriculture itself, as dealer-agents sought to run farmer-agents out of the trade.

There were still possibilities for farming people to serve as agents. Smaller companies in particular continued to solicit agents wherever they could find them. One such company offered the idea of agenting as a way to get started in business without any

¹¹⁰³ "A Farmer Agent Strikes Back All the Way from Maine." *Farm Implement News*, vol 7., no. 5, April 1886, 13.

¹¹⁰⁴ Urias Cato and Co. Correspondence. *Farm Implement News*, September 1886, vol. 7, no. 9, 18.

¹¹⁰⁵ C. H. Butler. Correspondence. *Farm Implements News*. vol. 7, no. 9, 18-24.

capital.¹¹⁰⁶ Such opportunities were open to women as well, at least for some of the companies that sold sewing and washing machines. Hiram Young remarked on a visit he received from “a lady washing machine agent” in 1893.¹¹⁰⁷ The more likely opportunities for farming people to act as agents would be to act as sub-agents for a large company like McCormick or Deering. The McCormick company had continued to hire local agents, who themselves continued to hire sub agents throughout the 1870s and 1880s.¹¹⁰⁸ As such, merchant dealer-agents sometimes launched their complaints at those large manufacturers and exhorted them to avoid farmer-agents at all costs. Nevertheless, both dealer-agents and large manufacturers together were successful at reducing the ability of farming people to assert control over technological farm systems.

Merchants’ efforts to consolidate the machine trade took institutional form under dealers’ associations. Dealer-agents and merchants in farm machinery formed conventions in an effort to create organizations that championed the interests of these merchants. Their efforts portended conflicts not only with farmers, but also with manufacturers over the control of access to consumers. Those conventions included statements that dealers should “avoid manufacturers who make agents of farmers, blacksmiths and others who only take the goods to ruin the trade.”¹¹⁰⁹ Merchants thus

¹¹⁰⁶ “Reliable Agents Started in Business Without Capital.” *Prairie Farmer*, August 27, 1887, 558.

¹¹⁰⁷ Hiram Young, “A Hoosier in Kansas: The Diary of Hiram H. Young 4,” *Kansas Historical Quarterly* 15, no. 1 (1947), 63.

¹¹⁰⁸ “Terms,” n.d., MC 53, McCormick Mss AD, Box 12, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society; Frank H. Matthews to Cyrus Hall McCormick, September 20, 1875, McCormick Mss 1A, Box 57, C.H.M. Correspondence.

¹¹⁰⁹ “A Dealer’s Convention.” *Farm Implement News*, vol. 6, no. 5, May 1885, 11; “Implement Dealer’s Conference.” *Farm Implements News*, vol. 6, no. 10, October 1885, 4; “Implement Dealer Association of Northern Iowa.” *Farm Implement News*, vol. 7, no. 5, May 1886, 16.

considered turning to boycotts as a strategy not only to force farmer-agents out of the industry, but also to discipline manufacturers into dealing only with established merchants. These organizations sought to make the selling of farm machines a profession further removed from the population of ordinary farmers. They also clearly saw the interests of farmers and dealers as separate, referring to a new law favoring consumers over debt collectors as “a shot from the enemy.”¹¹¹⁰ Dealer combinations were also clearly made in response to the combinations of farmers in Granges and Alliances.¹¹¹¹ In the midst of the development of the farm machine industry, farmers faced challenges from machine professionals who wanted to secure the control of the business, and its expertise, for themselves.

Large manufacturing firms like McCormick and Deering also asserted the primacy of their own place as producers, and especially as maintainers, of machines and thus also of industrial agriculture. Many machine companies decided that specialized experts would be an essential feature of the machine world with the introduction of self-binders. “Experting” had been a task that some machine company agents did from early on that involved helping to set up machines, as well as answering repair requests in the field.¹¹¹² Charles M. Marsh even did some experting for his own machine in 1869 after

¹¹¹⁰ “A Shot from the Enemy.” *Farm Implement News*. vol. 6, no. 8, August 1885, 11.

¹¹¹¹ Urias Cato. *Farm Implement News*. vol. 9, no 9, (September 1886): 18; E. G. Hanson. *Farm Implements News*. vol. 9, no. 9, (September 1886): 24.

¹¹¹² Cyrus Hall McCormick, “Instructions to Henry G. Thilburd as the Agent of Cyrus Hall McCormick Co.,” October 15, 1849, McCormick Mss 1A, Box 3, Folder 21, C.H.M. Correspondence; A. B. Metcalf, “Contract,” 1862, McCormick Mss 5X, Box 1, Folder 19, McCormick Harvesting Machine Company Advertising Material and Catalogs, 1847-1902, Wisconsin Historical Society.

securing a deal to have it manufactured. For him, the job consisted not only of setting the machine up in the fields of buyers, but also showing it off for interested neighbors or buyers as well as at local trials.¹¹¹³ Before the mid-1870s, however, this crowd of experts had mostly consisted of ordinary agents and sub-agents.

The introduction of self-binders augmented the role of experts as maintainers with duties and positions within the company that were distinct from those of dealers and agents. An article for *Farm Implement News* in 1885 looked back on the past decade's introduction of harvester experts as a substantial change for the industry that was connected to the introduction of self-binders: "As they were far more complicated than machinery with which farmers had previously been familiar, it was necessary at first that every machine put in the field should have expert attendance, more or less through the harvest."¹¹¹⁴ Experts also often handled the instillation of those self-binding attachments to compatible harvesters and thus played a critical role in the transition to mechanized binding itself. Manufacturers justified their construction of a new corps of experts on the basis of the increased complexity of those self-binders.

The McCormick company led the way in the professionalization of farm machine maintenance, but there was ambivalence within the company about how necessary the hiring of a large number of experts would be in the late 1870s. Correspondence from within the McCormick company included discussions between agents about how to handle the complexity of binders and the task of setting them up in the field. Some

¹¹¹³ Marsh, *Recollections*, 133-135.

¹¹¹⁴ "Experting." *Farm Implement News*, vol. 6, no. 7, July 1885, 10.

McCormick agents, like Charles Colahan, did not believe a separate corps of experts would be necessary and instead believed that regular agents could handle set-up and repairs.¹¹¹⁵ Others wrote to the home office requesting the help of experts because they believed there would not be enough local and sub-agents to meet the demands of farmers setting up new machines.¹¹¹⁶ One agent believed that the “seventy or eighty men around the country as experts” in 1878 would be too expensive for the company to keep on payroll indefinitely.¹¹¹⁷ Nevertheless, McCormick had chosen a path for the foreseeable future in hiring a corps of experts by the end of the 1870s.

The hiring of experts was a step towards a division between company men hired as machine sellers and those hired as machine maintainers. Experts now occupied a different position than the previous company agent who had handled repairs as well as sales. Additionally, there was increased division of roles even among expert repair men as not all company maintainers had the same responsibilities. Some spent most of their time in the repair shop of a local agent. These repair men did not go out into the field and deal with machines and their users on the farm. Field experts, on the other hand, traveled to the location of machines that needed to be set up or set right.¹¹¹⁸ Whether working in the field or in the repair shop, these men were paid by the McCormick company or a local

¹¹¹⁵ Charles Colahan to Cyrus Hall McCormick, May 23, 1878, McCormick Mss 1A, Box 71, C.H.M. Correspondence.

¹¹¹⁶ Frank Craycroft and Cyrus Hall McCormick, June 5, 1877, McCormick Mss 1A, Box 67, C.H.M. Correspondence.

¹¹¹⁷ W. J. Hanna to Cyrus Hall McCormick, August 10, 1878, McCormick Mss 1A, Box 71, C.H.M. Correspondence.

¹¹¹⁸ H. H. Wiggin to Cyrus Hall McCormick Jr., June 20, 1930, McCormick Mss AC, Box 38, Herbert Kellar Papers, 1887-1955.

agent's office. Walter A. Bates remembered experts being paid about \$50 a month during the summers. Shop repair men might have instead been paid a commission on repair work as indicated in an 1884 contract for a McCormick repair agent.¹¹¹⁹ These different roles were nonetheless part of the professionalization of farm machine maintenance within the structure of the McCormick company.

Farming people were aware of their increased need to rely on company experts. The *Western Rural* acknowledged that farmers might need more professional help with repairs. Similarly, a *Prairie Farmer* article many years later advised farmers to get the work they needed "from the machine shop" before the harvest.¹¹²⁰ The advice given to farmers about the importance of the set-up process accounted for the increased presence of professionals employed by machine companies. Companies touted the extent of their agency structures and the repair pieces they kept on hand.¹¹²¹ It was when they needed those parts that farming people would have to seek out machine company agents and experts.¹¹²²

Machine companies themselves made the case as to why farmers should rely on their own agents and experts for repairs. They often warned farmers against seeking

¹¹¹⁹ "Reminiscences of Walter A. Bates" in Kellar, "Harvester Reminiscences"; "Reminiscences of John Webster" in Kellar, "Harvester Reminiscences"; "Reminiscences of G. N. Fraziet" in Kellar, "Harvester Reminiscences"; "Repair Agency Contract," 1884, Box 12, MC 53, McCormick Collection Special Reports File, 1893-1963, Wisconsin Historical Society.

¹¹²⁰ "Repairing the Implements," *Western Rural*, April 15, 1882, 117; "Repair the Breaches Promptly," *Prairie Farmer*, November 9, 1895, 4.

¹¹²¹ "The Champion Reaping and Mowing Machines." *Prairie Farmer*, April 29, 1876, 138; "The Farmer's Friend Grain and Fertilizer Drill" (Farmer's Friend Manufacturing Co. Dayton, Ohio, 1877), Item ID: 08055057, Hagley Library, Trade Catalogs, 14.

¹¹²² Herbert Vinton, *Diaries*, July 31, 1888, for instance, was sent into town as a boy to retrieve "some little pieces" for the mower his grandfather broke.

repairs, and especially replacement parts, from anyone other than the official agents and experts of the company. A trade catalog of repairs for the Eclipse line of threshers advised users to avoid relying on their local “jack of all trades” or “the small country repair shop.”¹¹²³ Other warnings made clear that the objection was not just to the assumed lack of expertise on the part of the rural mechanic, but also to their lack of access to proper replacement parts. A catalogue for the Walter A. Wood company warned of “bogus sections, scythes and sickles.”¹¹²⁴ Similar warnings were issued by other companies, not only to farmers but to agents themselves.¹¹²⁵ The fact that the companies felt the need to issue these warnings implies that farming people were able to contest monopoly to some degree by finding ways to get replacements cheaper than company agents furnished them.

Yet the companies’ concerns for parts compatibility and quality should not be overlooked. Prominent voices of agriculture echoed company assertions. J. C. Bell, a speaker at a meeting of the Kansas State Board of Agriculture, devoted his speech to the reasons why farmers should deal with established agents of established companies who knew their machines and could always supply repair parts when needed.¹¹²⁶ As machines

¹¹²³ Frick Company, “Price List of Repairs or Extras for ‘Eclipse’ Engines, Separators, Frick Company ‘Vibrating Threshers, Saw Mills, Horsepowers, Cotton Gins” (Baltimore: I. Friendenwald, 1890), Item ID: 08055671, Hagley Library, Trade Catalogs, 80.

¹¹²⁴ Walter A. Wood Mowing and Reaping Machine Co., “Price List of Parts of Walter A. Wood Harvesting Machines with Changes in Prices, and New Telegraph Cipher for Machines and Parts” (Hoosick Falls, NY, 1889).

¹¹²⁵ G. M. Lewis and J. G. Moon, “Contract” (D. M. Osborne and Co., 1900), Box 11, Folder 2, Warshaw Collection, Agriculture, National Museum of American History, Smithsonian Institution.

¹¹²⁶ J. C. Bell. “The Implement Dealer and His Relation to the Farmer.” *Kansas Farmers*, January 25, 1900, 67-70. Newspapers.com. <https://newscomwc.newspapers.com/paper/kansas-farmer/2950/>.

became more complicated, exact replacement parts became more necessary and farming people had to rely further on manufacturers.

Professionalization also took some of the machine knowledge that already existed in farming communities and placed it under the control of manufacturers. Former expert S. S. Faes recounted McCormick and Deering recruited machine-minded farm boys for employment as experts.¹¹²⁷ Both Faes himself and another expert, Fred W. Jones, found their way from farming childhoods to work as experts. Yet many of these farmers-*cum*-experts entered those positions through factory work rather than through farm work. Both Jones and Faes had worked in machine manufacturing as well as farming before being hired as experts.¹¹²⁸ Sometimes factory knowledge was as useful as farm knowledge on repair missions. Jones, for instance, recounted his first repair job: “the only thing that I could think of to do was to practically tear down the whole machine and set it up right again exactly in accordance with the methods I had learned at the factory.”¹¹²⁹ Nevertheless, it worked, and the farmer wrote a letter commending Jones’ work to his employer. This strategy was more informed by Jones’ factory experience than by his farm experience with machines. The growing importance of the machine expert, and the growing importance of factory knowledge as opposed to field knowledge, began to displace farming people as the principal maintainers of their own machines.

¹¹²⁷ H. H. Wiggin to Cyrus Hall McCormick Jr., June 26, 1930, McCormick Mss AC, Box 38, Herbert Kellar Papers, 1887-1955.

¹¹²⁸ “Reminiscences of Fred. W. Jones in Kellar, “Harvester Reminiscences”; H. H. Wiggin to Cyrus Hall McCormick Jr., June 26, 1930, McCormick Mss AC, Box 38, Herbert Kellar Papers, 1887-1955.

¹¹²⁹ Fred Jones in Kellar, “Harvester Reminiscences.”

Experts were also tasked with changing farmers' behaviors to better accommodate not only machines, but the entire system of industrial agriculture that manufacturers championed. McCormick experts referred to part of their work as "farmer fixing," rather than machine fixing.¹¹³⁰ They understood their task as being one of teaching farmers how to responsibly, and profitably, handle the machines sold by McCormick, thus bringing profits to the company as well.

While former experts agreed that machine companies took repairs seriously, especially after the 1870s, they differed on just how seriously farming people took the maintenance of their machines.¹¹³¹ Fraziet, for instance, expressed some frustration that farmers did not properly store machines. Other experts recounted the difficulties of farmers in adjusting to the complexities of self-binders, including another tale of Fraziet's about a farmer who did not realize his binder was out of twine.¹¹³² But experts also saw farmers display a lot of skill and knowledge in their adoption of self-binders. Fraziet also wrote that, in fact, "the binder caused the farmer to get used to machines." He saw that farmers "took pride in being able to fix a binder [...] It was a great education for the farmer, who would be back in the old rut if he did not know the machine."¹¹³³ According

¹¹³⁰ "Reminiscences of G. N. Fraziet" in Kellar, "Harvester Reminiscences"; "Griffey" in H. H. Wiggin to Cyrus Hall McCormick Jr., June 27, 1930, McCormick Mss AC, Box 38, Herbert Kellar Papers, 1887-1955.

¹¹³¹ "Reminiscences of Walter H. Bates" in Kellar, "Harvester Reminiscences"; "Reminiscences of George Lincoln" in Kellar, "Harvester Reminiscences"; "Reminiscences of Samuel Wright" in Kellar, "Harvester Reminiscences."

¹¹³² "Reminiscences of G. N. Fraziet" in Kellar, "Harvester Reminiscences"; "Griffey" in H. H. Wiggin to Cyrus Hall McCormick Jr., June 27, 1930, McCormick Mss AC, Box 38, Herbert Kellar Papers, 1887-1955; "S. S. Faes" in H. H. Wiggin to Cyrus Hall McCormick Jr., June 26, 1930, McCormick Mss AC, Box 38, Herbert Kellar Papers, 1887-1955.

¹¹³³ "Reminiscences of G. N. Fraziet" in Kellar, "Harvester Reminiscences."

to Fraziet, while farmers did struggle with maintaining machines, they nonetheless continued to cultivate deep machine knowledge.

Even as they came to rely more upon machine companies and their agents and experts for repair parts and some knowledge, farming people continued to take pride in their command of their own machines. Nevertheless, the project of the company experts was conditioned by the assumption that it was the agents of machine companies, rather than farming people, who kept machines going. Manufacturers insured their ability to sell advanced machines regardless of the ability of farmers to keep those machines going themselves, and so also diminished the agency farming people held over industrial agriculture.

Farmers Accept Experts and Professionalization

In the years after the professionalization of farm machine maintenance, the subject of maintenance remained a terrain of struggle. Farmers, often through farm papers or through the Populist movement, continued to make claims to the production and ownership of industrial agriculture on the virtue of their status as producers and maintainers. They placed the blame for maintenance failures as well as for their broader economic struggles on the economy of circulation and on machine manufacturers, while their opponents blamed farmers themselves for the neglect of machinery. In the context of complicated machinery and the professionalization of machine repair, however,

farmers lost ground in their efforts to assert themselves as the producers and maintainers of industrial agriculture. Farmers came to accept the authority and control of manufacturers' agents and experts because they were dependent on them for parts and repairs in order to maintain their machines, and thus also, their farms. As long as manufacturers held a monopoly on these essential tools, farmers would remain dependent on, and subject to, manufacturers.

Some commentators blamed farming people's practices of machine maintenance, or perceived lack thereof, for their failures and indebtedness. Even newspaper editors sympathetic to the Populist causes, like the *Western Rural*, sometimes argued that the debt farmer suffered arose through a lack of adherence to discipline in maintenance.¹¹³⁴ Less sympathetic newspaper editors made the case clearer in blaming farmers for a purchasing system they had little power within. They offered imprudence in the purchase and care of machinery as an answer to the question "why some farmers do not succeed" and argued that "the bill for machinery on American farms is excessive only because there is not careful use and housing of implements."¹¹³⁵ These editors offered lack of care in maintenance as a reason that some farmers failed to profit from the industrialization of grain farming.

Many farmers rejected the idea that their own mechanical incompetence was to blame for their failures and asserted their continued status as the producers and

¹¹³⁴ "Economy in the Preservation of Tools." *Western Rural*, January 10, 1885, 18.

¹¹³⁵ "The Purchase of Farm Machinery." *Prairie Farmer*, April 27, 1895, 2; "Labor-Saving Implements." *Prairie Farmer*, July 20, 1895, 3; "Why Some Farmers Do Not Succeed." *Prairie Farmer*, February 10, 1900, 3; "Waste on the Farm." *Kansas Farmer*, March 29, 1893, 5.

maintainers of mechanized agriculture. First, they asserted their own machine knowledge and status as skilled technological laborers. The *Farmers' Alliance* newspaper of Lincoln, Nebraska, for instance, pointed to farmers' use of self-binders as proof that farmers were "skilled laborers:" "the self-binder is one of the most complicated of machines, and the most difficult of operation. But the successful farmer must know all its intricacies, and be able to take it apart and repair it."¹¹³⁶ Just as among the urban machinists of the contemporary labor movement, assertions of the command of complex technology served to support farmers' claims to the world those technologies built. Another article in the *Farmers' Alliance* channeled the farmers' battle against the middlemen by asserting that agents were not necessary for the use of farm machines. The writer wrote of company agents, "it is a piece of impertinence in anyone to waste your time in an effort to prove that he knows your business better than you." The article also asserted that farmers were perfectly capable, and in fact better served, by learning from one another than by learning from the representatives of manufacturers: "nine times out of ten the implement that would suit you is on a neighbor's farm. Examine it there, ask the owner all about it and make your decision."¹¹³⁷ Alliance papers also, like Granger papers before them, encouraged farmers to buy only as much machinery as they needed and could adequately maintain, but did not blame farmers for machine failures.¹¹³⁸ Farming people defended their machine knowledge in the context of conflicts with manufacturers.

¹¹³⁶ "The Farmer a Skilled Laborer." *Farmers' Alliance*, January 11, 1890, 2.

¹¹³⁷ "Buying Farm Implements." *Farmers' Alliance and Nebraska Independent*, May 19, 1892, 3.
<https://nebnewspapers.unl.edu/lccn/2017270209/>.

¹¹³⁸ "How Much Machinery?" *Alliance Standard*, November 4, 1892, 7.

However much knowledge about the inner workings of machines farmers possessed, they nonetheless depended on machine companies for replacement parts. This dependence disciplined farmers as consumers. The results of which can be seen in an instance when the necessary expert structure was not present. Canadian Populist and woman's movement activist, Nellie McClung recounted a story of her farm community's conflict with a machine company concerning experts and repair parts. McClung recalled that her family, along with others in their area, were compelled to switch from reapers to self-binders after increasing field size to keep up with fluctuating wheat prices. The members of the community asserted some collective consumer power by going to purchase six machines at the same time, thereby entitling them to a "special concession" of the manufacturers that any neighborhood with six binders would have plenty of repair parts shipped to a local blacksmith to distribute when necessary. The families went to town together in a procession to purchase the machines on credit, motivated to do so by the promise of necessary repair parts in their area.

Trouble ensued when the machines proved prone to defects—including a large crack in the wooden tongue of one machine that had been sanded and painted over—and many broke upon usage in the first harvest. Further, the company had not made repair parts available at the local blacksmith as promised. McClung's brother made a number of trips to a further-away town overnight in an effort to secure parts for the multiple breakages they encountered during that harvest. These trips were made on the same horse that had to pull the harvester during the day, which demonstrated the importance of

animals not only to machine use, but also their maintenance. The other families that had purchased binders experienced similar difficulties and mounting costs. Without adequate access to repairs, the families in the area suffered loss in the harvest of that year. To add insult to injury, the company blamed the farmers for the machines' failures in a letter that blamed "the hands of a bungling operator." The McClungs and their community experienced the conflict between farmers and manufacturers about who was to blame for machine failure first-hand. They also experienced the consequences of a lack of repair parts. Although many of these same farmers continued to use machines manufactured by this company in later decades, if only due to lack of options, McClung recalled that there was still bad blood between the farmers and that manufacturer in later years.¹¹³⁹

The devastating consequences of poor machinery and the inability to access repair parts left farming people to look for solutions. Ultimately, it also led them to accept company experts as suppliers of necessary parts and authorities over machine maintenance. Farmers continued to valorize machine knowledge as consumers. They believed that machine knowledge allowed farmers to make better decisions about machines. One article in the *Western Rural* described a lawsuit against a machine agent for misrepresenting the capabilities of a self-binder. The article also offered the cultivation of machine knowledge among farmers, including an understanding of "a short history of the different binders" as a way to protect farmers from getting swindled for bad

¹¹³⁹ McClung, *Clearing in the West*, 135-137; McClung, *The Stream Runs Fast*, 68-69.

machines.¹¹⁴⁰ Farming people could thus see knowledge itself as some defense against ending up in a situation like the McClungs, but even good machines required repairs.

Farmers' Alliances attempted to address the repair problem through their cooperatives. The *Farmers' Alliance* noted that the Nebraska state agency had been "considerably embarrassed" in 1890. The newspapers attributed their struggles to manufacturers' efforts to continue to protect their territorial agency systems. By 1890, however, the importance and authority of these agency systems was augmented by the fact that "in the case of complicated machinery it is often necessary to have an expert near where they are sold. It is also necessary to have depots of repairs accessible to their patrons." The solution the Alliance offered was "to make our state agency so strong that it can furnish a market for the entire output of the machines it wants, or at least so large a part of it that the heavy dealers could not afford to ignore it." Local county cooperative stores could then serve as depots for repair parts furnished by manufacturers who would work with the Alliances.¹¹⁴¹ This plan does not appear to have gotten far, but it did take the issue of repairs and parts seriously. Nevertheless, the growing corps of company experts offered an obstacle to Alliance efforts to overcome the authority of manufacturers and their agents in the farm machine market, as manufacturers sought to work through their own systems rather than to work with Alliances.

¹¹⁴⁰ "Farm Machinery," *Western Rural*, September 2, 1882, 277; That call echoed an earlier one for farmers to get together and inform each other of the quality of machines in the market. "Farm Machinery." *Western Rural*, September 25, 1880, 306.

¹¹⁴¹ "Cooperation, The State Alliance and Its State Agency." *Farmers' Alliance*, November 8, 1890, 2.

Another Alliance proposal further yielded to the authority of company agents and experts. D. H. Talbot, a member of the National Farmers' Alliance's Education Board, included an exhortation to machine manufacturers to make repairs accessible and to "act as a partner" with farmers in the duty of machine maintenance in a speech that was later printed in the *Western Rural*. Talbot believed this should be expected of manufacturers, in part because the machines themselves were too complicated and specialized for ordinary mechanics to handle many repairs. Talbot called on both manufacturers and legislators to promote responsible repair maintenance infrastructure:

The machine manufacturers should keep certain repairs for their machines within a given distance of the place where the machine was sold or where the purchaser stated at the time of purchase it was to be used, and if the repairs were not sold there, then the farmer should have the right to obtain damages to the extent of his loss from the machine manufacturer [...] it is a moral right that the machine man should act as a partner in a measure in keeping repairs near at hand, that the purchaser could receive full value for his investment in a machine which no mechanic ordinarily found can repair except minor breaks.¹¹⁴²

Talbot's exhortation that machine companies should maintain repair infrastructures wherever the sold machines was a demand on behalf of farmers' interests, but it also demonstrated that the Alliance ceded authority in the maintenance of farm machines to the growing structures of machine companies. Talbot and the Alliance were aware that farming people found themselves less able to handle repairs on the complex machines that were coming to dominate the market than they had been in the past

¹¹⁴² *Proceedings of the National Farmers' Alliance at Its Eleventh Annual Meeting Held At Omaha, Nebraska, January 27, 28 and 29, 1891* (Des Moines: The Homestead Company, 1891); "National Farmers Alliance." *Western Rural*, March 7, 1891, 149, reported this statement of the board member in an edition of the newspaper.

because of their reliance on repair parts. The farm press joined the Alliance in ceding this authority when editors encouraged farmers to only purchase complex machines from well-established companies with plenty of experts and agencies in their area in order to obtain parts.¹¹⁴³

Farming people contested the blame placed on them for their unequal position in the economic structures of industrial capitalism. Yet their ability to maintain and claim status as producers of systems of mechanized agriculture was undermined by their lessened importance as the maintainers of farm machines. The need to keep machines moving and get the crops harvested in order to pay mortgages continued to press farmers throughout the final decades of the century and influenced them to accept the relinquishment of their own authority over the technological systems of industrial agriculture. While farming people still contributed to the production and maintenance of industrial capitalism on the farm even at the end of the century, manufacturers and their experts won a central and controlling position as the producers and maintainers of machines after the professionalization of machine maintenance.

Conclusion

By the end of the century, the mechanization of grain agriculture in the American Midwest had reached the furthest points it would while still reliant on animal and human

¹¹⁴³ “Buying Farm Implements.” *Farmers’ Alliance and Nebraska Independent*, May 19, 1892, 3.

motive power. Gasoline farm traction engines would, over a long course of decades in the twentieth century, come to surpass the horse-drawn drills and harvesters of the nineteenth century. Electric sewing machines would slowly populate farm households as well.¹¹⁴⁴ The end of the nineteenth century also saw the end of wheat as the central crop grown throughout the Midwest, as the easternmost states of the region transitioned towards diversified systems of agriculture in decades prior and would come to be joined more slowly by the western prairie belt. Farmers in these states likewise turned to a greater variety of crops, especially corn, as foreign markets made wheat less profitable.¹¹⁴⁵ By the time these developments had come to pass, however, farming people had long produced and contended for ownership of the technological systems that constituted mechanized grain farming. They brought industrial capitalism to American agriculture by building technological systems that wrung as much grain out of the earth as possible. In the later decades, their status as the producers and maintainers of these technological systems was undermined by machine complexity and the actions of manufacturers, but their knowledge and labor nevertheless contributed to the origins of modern agriculture in the United States.

¹¹⁴⁴ Kline, *Consumers in the Country*; Jellison, *Entitled to Power*; Edgerton, *Shock of the Old*, 32-36; Winder, 112-113; Eleanor Arnold, *Voices of American Homemakers* (Bloomington: Indiana University Press, 1993).

¹¹⁴⁵ See Bogue, *From Prairie Belt to Corn Belt*.

Conclusion

Machines on the Farm has endeavored to demonstrate the participation of farming people in the production of industrial capitalism within the modern rural world. In doing so, it provides a study of tinkering and maintenance in a nineteenth-century context concerning individual machines in family operations, rather than large infrastructural projects. It also provides evidence that demonstrates how actively grain farmers contributed to the development of industrial capitalism in the nineteenth-century United States. In demonstrating each of these points, *Machines on the Farm* shows how farming people contributed not only as consumers, and not only as producers alongside machines on the farm, but also as producers of the industrial farm itself.

Producing the industrial farm involved both the use and maintenance of machines. When farming people made machines work with their ways of organizing rural social life and labor, they constructed technological systems. They likewise did so when they made machines work with the plants, fields, and animals that made up their farm systems. The use practices they developed in the middle decades of the century transformed machines and farms into mechanized grain agriculture. Maintenance and repair were also activities that constructed and reconstructed technological systems on the farm. Farming people fit their maintenance labor into the same social systems of labor organization through which they arranged other farm labor. Every time that farming people set up a harvester, or

repaired a broken sewing machine, they performed the productive labor of keeping complex technological systems going.

Yet farming people produced these systems in contested social and economic contexts. They struggled with machine manufacturers and their agents for control of those systems. Farming people sought to direct and profit from the technological systems they had produced on their farms. Manufacturers and their agents sought to do the same, and the patent and credit systems of nineteenth-century capitalism generally aided their efforts over those of farmers. The farmers' position was also weakened by their general need to keep producing wheat despite fluctuating prices in order to meet the fixed costs of establishing a farm and capitalizing it with machinery. Nevertheless, farming people made their claims as producers through organizations and as individuals. The Granger movement of the 1870s and the Farmers' Alliances asserted farmers' claims as producers, contested those of manufacturers, and organized economically in their interests as both the consumers of manufactured farm machines and the producers of mechanized systems. While the economic power of manufacturers and the inability of farmers' organizations to take on roles in the distribution of machines and repair parts ultimately limited these efforts, they nonetheless demonstrated the efforts of farming people to claim the fruits of mechanized agriculture.

Farming people also asserted their claims as individuals. Individual farmers claimed to be the producers not only of crops and livestock, but also of technological systems, when they wrote to the McCormick company with claims about the invention

and improvement of harvesters. The control of manufacturers over the trajectory of new developments in the industry—particularly the ascendance of self-binding harvesters in the late 1870s and 1880s—undermined farmers’ efforts to make their own claims.

The ascendance of self-binding harvesters changed the dynamics of how farming people could produce industrial agriculture through use and maintenance. Maintaining these more complicated machines was more difficult for farmers. Farmers became even more dependent on manufacturers and their experts for maintenance and the supply of replacement parts. Nevertheless, farming people still demonstrated expertise in their use and maintenance of these new machines through the end of the century.

The adoption of self-binders and the mechanization of grain agriculture have been remembered as a part of two different narratives of the growth of industrial capitalism. The first is a narrative of individual ingenuity, by which bright, machine-minded inventors contributed to the technological marvels of the twentieth century. The second is a narrative of common farm labor and work ethic. The examples of two boys, C. Francis Jenkins, and Hugh Orchard, and their first repair experiences with self-binding harvesters show not only how ordinary farm people displayed mechanical knowledge in their care of machines, but also two separate ways in which farm machines entered popular memory.

In the final decades of the nineteenth century, many children grew up alongside machines that they helped to use and maintain. C. Francis Jenkins, who grew up on a farm near Richmond, Indiana, recalled working with his dad on the reaper and tinkering with a sewing machine as a child. But his public emergence as a machine-minded man

came in the 1880s when a neighbor first purchased a self-binding harvester. Like many farmers, those in Jenkins' area struggled to get the machine running at first. Jenkins told his story of "studying the intricacies of the knotting mechanism" and learning how to handle it over a few days' time. He cast this event as evidence of his individual mechanical aptitude. Being the only one in the area who could command the complicated machine foreshadowed his future career as an inventor and engineer who participated in the technological innovation of the twentieth century. The scene was thus pivotal in an autobiography titled, *The Boyhood of an Inventor*.¹¹⁴⁶

Iowa farm boy Hugh Orchard remembered his first experience with a self-binder in a much less grandiose way. Like Jenkins, Orchard had a deep interest in the machines around the farm and was immediately drawn to the binder, especially its knotting mechanism, as soon as his father brought it home. He recalled: "Whenever I got a chance, and nobody was watching, I would pull down the twine in a loop about the size of a bundle, trip the rigger and turn the bind apparatus over, and watch the little thingumbob grab the twine and tie it in a chicken head knot." He believed he did this more than a hundred times before experiencing any problems. One time, however, as a part of his "careful study of the cog wheel" he pulled out a part for experimentation and "the whole thing locked itself tight and refused to go on or back." Orchard feared that his father would be angry when he discovered the broken binder. Fortunately, the machine was to be stored in its shed for months until the next harvest. Orchard continually snuck out to

¹¹⁴⁶ Jenkins, 46-49

the shed to fix the machine in secret throughout the summer and winter with no success. He thought about seeking help from a friend who was good with machines, but this neighbor did not yet have any experience with binders. He thought about writing a letter to the machine company but could not bring himself to do it. This process lasted until just weeks before Orchard's father was set to bring the machine back out for the harvest and Orchard, in desperation, prayed.

The next time he went out to the shed to work on the machine, he found the source of his woes: "My eyes fell on a trigger sort of thing that was resting against a lug. I raised the lug up, so the trigger didn't touch, and believe it or not, the handles came free so I could turn them backward." A few more steps of tinkering later, and Orchard had the machine set to tie a knot. But the machine was not exactly the same as how it had arrived from the factory. Orchard, however, would not alter anything else now that he had it moving. When the machine was finally wheeled out of the shed to begin the next season's cutting, "Frank noticed that the oil can was toppled over on its side and told me to straighten it. But I pretended not to hear him and just left it lying there. I would not have tried to change anything about that binder for the best horse in Iowa."¹¹⁴⁷ Orchard was quite content to let the machine be and to let the episode pass without remark.

The actions of both Orchard and Jenkins were quite similar in their most basic sense, but they differ in how those actions were valorized and remembered in relation to the growth of industrial capitalism. Both boys altered the machines they were confronted

¹¹⁴⁷ Orchard, 57-61.

with in an effort to set them right, or at least to set them running again. However, Jenkins was celebrated by the adults of his community for his mechanical prowess while Orchard kept his activities hidden in order to hide the accident that had caused the problem in the first place. Jenkins' tale shows how tinkering could be fit into the popular memory of invention within industrial capitalism as capable individuals found technological solutions to create abundance. Orchard's tale, however, demonstrates how tinkering and repair could be forgotten alongside the breakages that necessitated them. As a response to inevitable decay over time, or to human mistakes like that of young Hugh Orchard, the common labor of maintenance is often pleasantly forgotten as soon as it is accomplished. But experiences like Orchard's were central to the industrialization of the farm as well as to other stories of human relationships with the human-built world.

As many farming people—including men and women, as well as boys and girls—set machines right as best they could like young Orchard over the course of the century, they actively produced the technology itself as it existed and operated on the farm. As demonstrated throughout this dissertation, farming people took actions to make machines work in their contexts and with their farm systems, with or without the intentions and assistance of manufacturers and their agents. The necessities of these productive actions brought farming people into conflict with one another and with manufacturers and their agents over these systems of mechanized agriculture that they produced. Yet at the root of it all was common human ingenuity and labor such as the sort that both the young Orchard and Jenkins displayed. Most instances of harvester tinkering were not the start of

careers at the forefront of invention within the emerging institutions of industrial capitalism, but all contributed to the production of the technological systems that rural people lived within.