



John H. Wilder and Andrew Palm built the massive windmill which was a landmark for many years at Lawrence and was the source of power for their milling and manufacturing business from 1864 to 1885. The sketch above, though not an entirely accurate drawing of the windmill and adjoining buildings, was used on the firm's letterhead. Sketch reproduced courtesy of the Watkins Community Museum, Lawrence. Below are two advertisements from Lawrence newspapers promoting the business. At left is the first advertisement for the milling operation in the *Lawrence Kansas State Journal*, June 30, 1864. At right is an advertisement from the *Lawrence Kansas Weekly Tribune*, January 25, 1866, advertising the company which was by then operating a carriage and plow factory.

**Wind Mill.**

WILDER & PALM would inform the farmers in this and adjacent counties, that they have put up and are running a

**"CORN RUN"**

in their Wind Mill near Lawrence, and that they are prepared to grind Corn at rates that will astonish them.

They will buy Corn at Market Prices, and

**PAY CASH!**

Corn Meal constantly kept on hand for sale.

LAWRENCE, June 29, 1864. d15-tf

**WIND MILL**

**AGRICULTURAL WORKS.**

**WILDER & PALM,**

**MANUFACTURERS OF THE**

best Refined Cast and German Steel Plows, Cultivators, Shovel Plows, &c. Also the celebrated

**ROUGH AND READY**

**GANG PLOW.**

We have the Patent Right for all Southern Kansas. Wagons on hand for sale, or made to order. Go to the Manufacturers to buy, save the commission and pay in Corn, Wheat or Greenbacks. We will not be undersold.

**ALL WORK WARRANTED.**

LAWRENCE, Jan. 25, 1866. WILDER & PALM. d&wtf.

# THE LAWRENCE WINDMILL

JOHN M. PETERSON

FOR MORE than 40 years, from 1863 until 1905, the chief landmark of Lawrence was the massive windmill which stood on the first high hill west of the center of town. The tall, cone-shaped tower, with its distinctive onion-shaped dome and its large wheel with four white vanes, symbolized Lawrence to most of its residents and its visitors.<sup>1</sup> Even today, more than 70 years after its destruction, the Lawrence windmill appears from time to time as a symbol of the city. Now that we again are looking to the wind as a source of power, it seems appropriate to inquire why the windmill happened to be built in Lawrence, how it worked, what it was used for, and what became of it.

The Lawrence windmill was the first wind-driven mill in Kansas and probably was the only one that furnished power to a factory of any size. It also was a forerunner of the vast wind-power development which took place in the United States in the last part of the 19th century. Within a few years after its completion small windmills became practical for pumping water and similar chores. In time almost every farmstead in the western two thirds of the country, and many homes in towns too small to have a centralized water system, possessed a windmill to pump water from the well. Commercial applications were not common but at least three grist mills operated in Kansas and wind-driven grist and saw mills were found here and there in other states.

As to why Lawrence happened to be the site of this unusual pioneering effort to develop wind power, one can begin by pointing out that it had a good supply of the first requirement, wind, but so did the rest of Kansas and the other Plains states. Lawrence also had rather steep hills near the center of town, its population was growing rapidly, and it was surrounded by a settled grain-farming area. Furthermore, Lawrence at this time lacked grain milling enterprises; Blood and Kimball's

somewhat antiquated steam-powered mill had the field to itself in 1862. But beyond these favorable circumstances, the event that precipitated the creation of the Lawrence windmill was the coming together of two men, John H. Wilder and Andrew Palmquist.<sup>2</sup> Wilder had considerable business experience and was one of the pioneers of Lawrence; Palmquist had experience as a miller and was familiar with the use of windmills to grind grain and do other tasks in his native country, Sweden.

John H. Wilder was born on June 19, 1829, in Worcester county, Massachusetts, the son of Abraham and Cynthia Wilder. In his youth he is said to have studied civil engineering but we have no evidence that he practiced that profession. He also is said to have learned the trade of blacksmithing from his father. In October, 1854, he and his father arrived in Lawrence as members of the Third Emigrant Aid Company party.<sup>3</sup> The rest of the family, including his brother Abram and his sister Lucy followed in the spring of 1855. Not long after his arrival Wilder became a partner with George W. Hutchinson in one of the earliest merchandising ventures in Lawrence.<sup>4</sup> Later Hutchinson sold out to James Blood. It may be that Wilder sold his interest in James Blood and Company in the spring of 1861 when he opened the Lawrence Carriage Manufactory on the corner of Kentucky and Winthrop (now Seventh) streets. This shop, which he leased from G. Churchill, was advertised as being prepared to build carriages, wagons, and plows, as well as to repair and paint such equipment and to shoe horses.<sup>5</sup>

Andrew Palm was born in Killerod, Billinge Parish, Sweden, on April 30, 1835.<sup>6</sup> His original name, Palmquist, was changed to Palm

2. Some accounts credit J. C. Trask, editor of the *Lawrence Journal*, as being a third man intimately involved in the project. Available evidence does not show that he had any part in conceiving or carrying out the enterprise although he lent money to Wilder and Palmquist.

3. Louise Barry, "The Emigrant Aid Company Parties of 1854," *Kansas Historical Quarterly*, v. 12 (May, 1943), p. 136.

4. A. T. Andreas and W. C. Cutler, *History of the State of Kansas* (Chicago: A. T. Andreas, 1883), p. 347.

5. *Kansas State Journal*, Lawrence, May 2, 1861.

6. Based on the inscription on his grave marker in Oak Hill cemetery, Lawrence. His daughter, Blenda, states that he was born in Lund but probably intended to say "near Lund."—Blenda Palm Greenwood, manuscript biography of Andrew Palm, Kansas State Historical Society library.

1. The windmill became so identified with Lawrence that one traveler, writing about a trip through Lawrence in 1859, thought he remembered . . . the huge windmill on the north end of Mount Oread being the most conspicuous object in sight.—J. R. Mead, "Trails in Southern Kansas," *Kansas Historical Collections*, v. 5, p. 91. This was nearly five years before the windmill was built.

when he was naturalized in the United States. Billinge, which is about 20 miles north of Lund, is in Skåne, the southernmost portion of Sweden. At one time windmills were very common there and the skeletal remains of large wooden mills could be seen here and there in the countryside as recently as 10 years ago. Palm received his journeyman's papers as a blacksmith from the Mechanical Association of Lund in 1855 upon completing a four-year apprenticeship.<sup>7</sup> After working for a time in shipyards in Sweden he emigrated to the United States. Entering this country at Boston, he worked as a blacksmith in Massachusetts for a short period and then moved to Bloomington, Kan., possibly as early as 1858.

Bloomington was a small town southwest of Lawrence situated near, and a rival of, the town of Clinton. We do not know why Andrew Palm settled there; possibly he was attracted by a job as blacksmith and stayed because of an opportunity to get into the milling business. A steam sawmill, started originally by Henry Hiatt, Jubal Swain, and Paul Berkaw (or Berkau), fell on hard times and was sold on August 20, 1858, to Oliver Barber, the largest creditor, for \$1.00.<sup>8</sup> Apparently Andrew Palmquist, as he was then known, obtained an interest in this mill and ran it for some time. Land records show that he bought lots in Bloomington in 1860 and 1861 from Evalina and Paul Berkau and from Mary Swain, and a Lawrence newspaper in 1863 described him as "... an intelligent Swede, who a year or two ago purchased the steam mill at Bloomington from Mr. Berkau."<sup>9</sup> Thus, although we have only fragmentary information, there seems to be a factual basis for the assertion that Palm engaged in the sawmill and gristmill business from 1858 to 1862.

**S**OURCES differ as to why Palm left Bloomington but agree that in 1862 he moved to Lawrence. It appears that a fire damaged or destroyed his mill and it may be that a fire or tornado also destroyed his house. In any case shortly after arriving in Lawrence Palm became associated with John Wilder, possibly as a blacksmith in Wilder's carriage and plow manufactory. By this time it seems likely that

Palm had conceived the idea of building a windmill in Kansas like the ones he remembered from his youth in Sweden. His mind may have been turned in this direction by his experience with the danger of fire in a steam-powered mill. Also the free and nearly effortless harnessing of the wind had a considerable economic advantage over the steam engine which had to be fed wood or coal.<sup>10</sup>

It should be noted that Andrew Palm was not the first person in Douglas county to consider the possibility of using wind power. As early as 1857 a newspaper carried a report that a windmill was being built at Wakarusa to grind grain, turn a lathe, and operate a shingle machine.<sup>11</sup> No further mention of this enterprise has been found and it probably never materialized, but the idea of using wind-power continued to be of interest. By the 1860's magazines such as the *Scientific American* were publishing descriptions of various newly patented windmills which were held to be usable for various purposes, even plowing!<sup>12</sup> Near Lawrence, Henry Hiatt of Twin Mound in May, 1863, announced that he was putting up a self-regulating windmill of commercial design to drive an "extensive flouring mill."<sup>13</sup> In this case, Hiatt apparently found the windmill to be inadequate as, so far as is known, the mill he operated for many years at Twin Mound was powered by steam. For the most part the other patented windmills were found to be useful only for jobs requiring low horsepower, primarily pumping water. Thus, when Palm proposed to build a windmill it was not his idea that was new but the magnitude of his project and the type of mill that he planned to build.

John Wilder appears to have been receptive to Palm's windmill proposal. He undoubtedly recognized that the lack of a good mill in Lawrence represented a business opportunity and that a cheap source of power would be a considerable advantage in the carriage and plow manufacturing business. Although the windmill enterprise was described only as a flouring mill when it was under construction, it seems almost certain that Wilder and Palm had more than a gristmill in mind when they

10. The other possible source of power, water, was very difficult to harness in this area. The Kansas river was too large and unstable and the Wakarusa was subject to frequent flooding and lacked good dam sites.

11. *Lawrence Republican*, September 3, 1857.

12. *Scientific American*, New York, January 17, 1863.

13. *Kansas State Journal*, May 21, 1863.

7. Andreas-Cutler, *History of Kansas*, p. 342.

8. Martha J. Parker and Betty A. Laird, *Soil of Our Souls* (Lawrence: Coronado Press, 1976), p. 35.

9. *Kansas State Journal*, June 18, 1863.

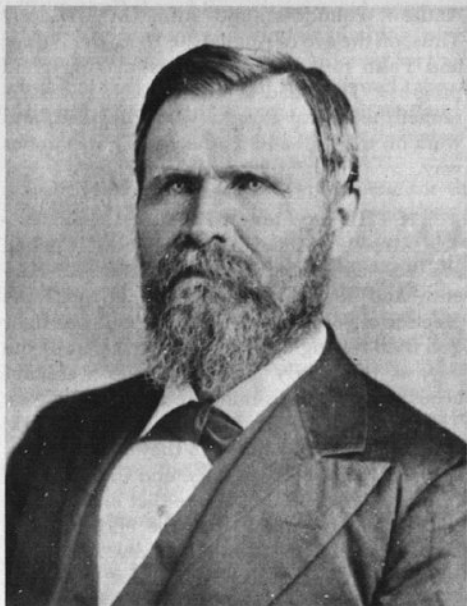


planned and built it. Its large size, and the fact that they moved the manufacturing business to the mill site shortly after the windmill was completed, leads to the conclusion that they intended to have enough power for both a mill and a machine shop.

During the summer or early fall of 1862 Wilder and Palm must have entered into some sort of agreement, although it may have not been a formal partnership. Between them they must have felt that they had enough resources to get their enterprise started and Wilder undoubtedly knew that he could rely on his parents for assistance in getting credit. What part, if any, J. C. Trask played at this time is unknown, and there is no evidence of the mysterious Englishman, Garrett, and his loan of \$10,000 mentioned in so many stories about the windmill.<sup>14</sup> As most of the material needed for the mill could be found in or near Lawrence, the two essential things they lacked were a site and the technical know-how to build the mill and its machinery. John Wilder apparently agreed to obtain a site while Andrew Palm sought the required technical assistance.

Palm, naturally, thought of Sweden as the best place to find the help they needed. He is said to have left Lawrence in November, 1862, and to have returned on June 15, 1863.<sup>15</sup> What he obtained in Sweden is difficult to say with certainty; probably measurements and drawings of mill structures and mill machinery and, possibly, some special tools. Most importantly he brought with him a Mr. Penquist, a master mechanic with much experience in building windmills, and either six or 10 other experienced millwrights.<sup>16</sup>

Within a few weeks after the Swedes arrived in Lawrence work began on the windmill. Wilder already had men working to bring in stone for the foundation and the timber needed



John H. Wilder (1829-1889) came to Kansas from Massachusetts in 1854 as a member of the third Emigrant Aid Company party. He had studied civil engineering, had learned the trade of blacksmithing, and brought to the partnership with Andrew Palm considerable business experience. This photograph taken about 1880, reproduced courtesy Watkins Community Museum, Lawrence.

for the mill. He also may have leased from Ferdinand Fuller a site on top of a hill just south of the west end of Warren (now Ninth) street. By July 30 excavation for the mill's foundation had begun there and Andrew Palm and his crew of Swedes were working on the machinery for the mill at a site near John Wilder's carriage shop at Seventh and Kentucky.<sup>17</sup> During the next 20 days work continued on the heavy foundation (four to five feet thick), a large amount of lumber and heavy timber was collected at the site where the mill machinery was being fabricated, and some progress was made on shaping parts for the machinery and the mill superstructure. Financing also had been arranged as on June 20, 1863, J. C. Trask took a mortgage on Lot 45 on Massachusetts street, owned by Abraham and Cynthia Wilder, as security for a \$4,000 loan to

14. For example, see Kenneth A. Middleton, *Manufacturing in Lawrence, Kansas, 1854-1900* (Thesis, University of Kansas, 1941), p. 34.

15. Emory Lindquist, "Swedes in Kansas Before the Civil War," *Kansas Historical Quarterly*, v. 19 (August, 1951), p. 265. The ship on which Palm and the Swedish workmen came to the United States had an exciting but inconsequential encounter with the Confederate raider, the *Alabama*.

16. Most published accounts state that 11 Swedes returned with Palm. The only contemporary source, the *Kansas State Journal*, June 18, 1863, gives the number as seven. Mr. Penquist is named in the *Kansas Daily Tribune*, Lawrence, December 27, 1863. Accounts stating that Palm brought the mill machinery from Sweden are difficult to credit. Much of it was too large to ship without a great deal of trouble and there are no contemporary accounts substantiating that origin of the mill machinery.

17. *Kansas State Journal*, July 30, 1863.

Andrew Palmquist and Anna M. Wilder.<sup>18</sup> Thus, on the eve of August 20, 1863, the Wilder and Palm mill enterprise was making good progress. They had a site, financing was arranged, technical experts were on hand, and work on the mill and its machinery was under way.

ON THE morning of August 21, 1863, Andrew Palm and his crew went, as usual, at a very early hour to the worksite near Seventh and Kentucky. They had adopted the practice of going to work as soon as it was light and then resting during the hottest part of the day, as the newly arrived Swedes were not accustomed to the summer climate of Kansas. That morning they had no sooner begun work, shortly after 5:00 a.m., than they were startled and alarmed by shots, yells, and the sound of running horses. Being aware that armed raids could happen at any time, the entire group, probably at the direction of Andrew Palm, ran, carrying axes, hatchets, and other tools that might serve as weapons, to the stone house on Kentucky street occupied by John Wilder and his family, which was less than a block away.<sup>19</sup> Tradition says that 18 men were safely sheltered from Quantrill's raiders in this house. Whether or not the story is true that some of Quantrill's men asked a small boy if there were any men in the house and turned away when he answered that the cellar was full of them, it is a fact that Wilder, Palm, and most of their workmen survived the raid unharmed.

J. C. Trask was not so fortunate. He was one of the four men shot down by some of the raiders after they had been given "safe conduct" to go to the Eldridge Hotel. A Swedish workman, L. Johnson, and his son, Gus, who apparently were not with the other Swedes, were shot in or near the tent where they were sleeping when the raid started. The elder Johnson was crippled for life by a bullet through the groin; the younger man suffered

only a grazed scalp.<sup>20</sup> Some of the men working on the mill foundation may have been killed as, years later, F. Gleason remembered seeing a man shot and his body falling into the cellar of the mill.<sup>21</sup> There was little that Quantrill and his men could do to damage the mill foundation but part of the mill was reported to have been burned. This must refer to some of the timbers and lumber obtained and prepared for use in the mill.

As Wilder and Palm and their workmen suffered little from the raid, it is likely that they spent the next few days helping to bury the dead, tending the injured, and cleaning up the debris. In common with the rest of the town, it was not long before they returned to their own affairs, replacing whatever material was lost or damaged and picking up the construction of the mill and the fabrication of its machinery where it had been interrupted. One Lawrence newspaper resumed publication on October 1 but the first mention of the windmill after the raid was on December 27 when the *Daily Tribune* mentioned that an extensive flouring mill was being erected on the bluffs west of the city.<sup>22</sup>

MILLING competition in Lawrence was on the rise. On November 5 it was reported that Henry Brown and Thomas Guest soon would be ready to grind wheat and corn at their mill in the east part of town.<sup>23</sup> In July they had begun installing flour milling machinery in an old mill building which seems to have received little or no damage from Quantrill and his men. Of even greater concern to the windmill builders was the announcement on November 19 that R. A. and E. B. Hayes had begun the erection of a new steam-powered flouring mill on the corner of Connecticut and Quincy (now 11th) streets.<sup>24</sup> The Hayes brothers, who were newcomers to the town and seemed to have strong financial backing, were said to be erecting a three-story building 40 by 50 feet in size.

Construction of the windmill continued through the winter. Early in March the *Tribune* commented that it was nearly completed and that the wheels and other woodwork were

18. Office of the register of deeds, Douglas county, "Mortgages," v. E, p. 217. Lot 45 was on the southwest corner of Massachusetts street and Henry (now Eighth) where B. W. Woodward and his wife, Lucy, John Wilder's sister, operated the Round Corner Drug Store and wholesale drug business. Wilder's wife, Anna M., signed many of the early legal papers concerning the windmill.

19. Based mostly on an undated clipping from an unspecified newspaper in the clipping collection of the Kansas State Historical Society library. The byline on the story is George R. Chrisman, but probably should be George R. Crissman, who received a B. A. from the University of Kansas in 1898. This is the earliest version of many of the stories about the windmill and, in my opinion, the most reliable.

20. *Ibid.*

21. Andreas-Cutler, *History of Kansas*, p. 336.

22. *Kansas Daily Tribune*, December 27, 1863.

23. *Kansas State Journal*, November 5, 1863.

24. *Ibid.*, November 19, 1863.

being constructed of the best seasoned woods and were being formed with great skill and care. Three days later the same newspaper reported that the windmill was being sided up and that the stone mill being built by the Hayes brothers was approaching completion.<sup>25</sup> Meanwhile the Wilder and Palm partnership had been formed and had taken over the Wilder carriage and plow business. Their first advertisement stressed blacksmithing and announced that "500 Lawrence plows, wagons, carriages, etc." had been manufactured and were for sale in their establishment at Nos. 27 and 29 Vermont street.<sup>26</sup>

On March 30 the Swede's were reported to have held a social gathering at the mill, possibly to celebrate the completion of the mill's siding.<sup>27</sup> April 19 would have been equally suitable for a party as on that date Anna M. Wilder took title to 34 acres of land from Ferdinand and Martha Fuller for the sum of \$500.<sup>28</sup> This plot included the site on which the mill was being constructed. Less than a month later the wheels began to turn, or as the *Tribune* put it, "The wind mill begins to flop its wings."<sup>29</sup> About another month was needed to finish installing and testing the equipment. On June 23 the *Journal* announced that the windmill was in successful operation and that the proprietors expected to grind 25 bushels of corn an hour. Two days later the *Tribune* reported that the windmill was in good running order, was capable of keeping a pair of corn stones running steadily in a moderate wind with only about half of its canvas up, and that "It appears to us a complete success."<sup>30</sup>

Andrew Palm had good reason to be proud of the realization of his dream of a windmill in Lawrence. The residents of the town and the local press were impressed by the massive structure with its great sails which stood out against the skyline to the west. The contrast with the noisy and dirty steam engines which ran the other mills in Lawrence also was noted.

"It runs all the while, eats no wood, consumes no water and asks absolutely nothing of its proprietors as a condition for laboring for them but that they shall spread its sails and take off the break [*sic*]. It is a grand experiment and a most successful one, and will make its owner's rich—a reward well deserved."<sup>31</sup>

On June 30 the first advertisement for the "Wind Mill" appeared in the Lawrence newspapers. Wilder and Palm wished to inform the farmers in Douglas and adjacent counties that they were operating a "corn run" in their "Wind Mill" near Lawrence and that their rates for grinding was astonishingly low. They went on to say that they were prepared to buy corn for cash at market prices and that they would keep a supply of corn meal on hand for sale.<sup>32</sup> If there had been a race between the windmill and the Hayes Bros. mill, later called the Pacific Mills, Wilder and Palm clearly won the first round as the Pacific Mills did not begin operating until the following December.

Andrew Palm, undoubtedly feeling that he now was on the way to success in business, married Charlotte Peterson of Lawrence on August 4. The bride was a native of Sweden who had come to this country as a young girl. The Palms obtained a house site the next spring by purchasing 1.2 acres of land near the mill from the Wilders for \$150,<sup>33</sup> but they do not appear to have built on it for several years.

AT THIS point it might be well to attempt to describe just what it was that Andrew Palm and John Wilder had built. The Lawrence windmill was a tall but sturdy wood structure standing on a foundation of rough dressed stone. It was octagonal in shape and the wooden portion had a considerable taper to the beginning of the dome. The dome, or cap, was an onion-shaped bulb reminiscent of those on Russian Orthodox churches and some churches in Sweden. The wheel was mounted in this cap, which could be rotated horizontally to direct the wheel into the wind.<sup>34</sup> The stone

25. *Kansas Daily Tribune*, March 3 and 6, 1864. The newspaper was quite premature in stating that either mill was nearing completion.

26. *Kansas State Journal*, February 4, 1864.

27. *Kansas Daily Tribune*, March 30, 1864.

28. Office of the register of deeds, Douglas county, "Deeds," Book I, p. 19. This land was in the northwest quarter of Sec. 36, T. 12, R. 19. Fuller, an architect and building contractor, was a member of the First Emigrant Aid Party.

29. *Kansas Daily Tribune*, May 18, 1864.

30. *Kansas State Journal*, June 23, 1864, and *Kansas Daily Tribune*, June 25, 1864.

31. *Kansas State Journal*, June 30, 1864.

32. *Ibid.*

33. Douglas county, "Deeds," Book P, p. 314. The deed was dated April 1, 1865.

34. The Lawrence windmill was frequently described as a "Dutch" or Holland mill. Actually it should have been called a "cap" or "smock" mill, as distinguished from a "post" mill. Both types were widely used in Holland, as well as many other European countries. In a cap mill only the top portion turns to shift the wheel into the wind; in a post mill the entire mill is mounted on a very strong post and pivots on this post to turn the wheel into the wind.





Andrew Palm (1835-1906), left, had experience as a miller and was familiar with the use of windmills in his native Sweden. After forming the partnership with John Wilder, he returned to Sweden to obtain plans and skilled millwrights to assist with the building of the windmill. Pictured with him are his wife, Charlotte Peterson Palm; son-in-law, A. N. Reynolds; daughter, Blenda Palm Reynolds; and granddaughter, Elizabeth Reynolds. This 1894 photograph reproduced courtesy Watkins Community Museum, Lawrence.

foundation was sunk into the ground several feet and extended about 10 feet above ground. It was made of native rock and may have been as much as five feet thick. According to reports the superstructure was made of native timber, primarily oak, which was cut along the Kansas river, while the shingles which covered the structure were made of walnut.<sup>35</sup>

The Lawrence windmill had four stories above the stone basement, counting the rotatable cap as the top story. The point of the cap was 64 feet above ground level.<sup>36</sup> The basement, or foundation, was 32 feet across while the widest part of the cap was only 19 feet across. Each of the four arms making up the wheel was 34 feet long, giving it a total sweep

of 68 feet. Each arm, said to have been made of two 12-by-12 inch timbers, carried a lattice-work vane six and a half feet wide and 27 feet long. Canvas sails were stretched across these vanes to catch the wind. The sails could be partially or completely furled to adjust for the strength of the wind. The wheel's rotation could be slowed or stopped by a brake band, controlled by a longer lever, which encircled one of the large wheels inside the mill.

The mill was cut through at the basement level by an arched driveway eight feet high and nine and a half feet wide through which customers could drive their wagons. This driveway ran from east to west, parallel with what now is Ninth street. On the north and south sides there were doors into the structure at ground level. There were four windows on each of the first three floors but only one in the cap. A wooden walkway extending out about 10 feet circled the mill at the top of the foundation, roughly 10 feet above the ground. This walkway, which was supported by 24 six-by-six-inch timbers, carried, on its inside edge next to the mill, a track three and a half feet wide. A wheel which supported and controlled the dome-shifting mechanism ran on this track.

35. Many descriptions of the windmill state that it was covered with walnut shingles which cost \$10 per thousand and were brought from Chicago by ox team. The cost may be correct but I doubt that walnut shingles were brought from Chicago to an area 500 miles away in which walnut trees were common. Herbert Bailey, *16th Annual Report of the Kansas Bureau of Labor and Industry for 1900*, p. 173, states that native walnut shingles were used on the Lawrence windmill. George R. Crissman, in the previously cited clipping, agrees, stating that the shingles were steamed and split in Lawrence and that the entire superstructure was made of native hardwood.

36. I have relied on a scale drawing by George J. Hood, dated January 21, 1904, for the dimensions of the windmill. The late Professor Hood was well-known for attention to detail and his drawing was made while the mill was still standing. Copies of Hood's drawing are to be found in the Spencer Research Library and the Watkins Community Museum, both in Lawrence.

Several heavy wooden beams attached to the dome converged at and rested on this wheel. The miller or his assistant, by turning the attached crank could cause this wheel to move around the walkway, thereby rotating the dome and bringing the sails into the wind.<sup>37</sup> The dome must have rested on some sort of roller bearing which allowed it to be turned without too much effort.

Unfortunately we have no photographs or drawings of the internal mechanism of the mill. The massive gears which made up the power train of the mill were very heavy oak wheels which had strong wooden pegs driven into holes around their rims. The pegs meshed with pegs in other similar wheels to transmit power from one shaft to another. One such gear, six feet in diameter, was fixed to the axle of the mill wheel inside of the dome. That gear meshed with a larger, horizontally mounted gear on a heavy shaft that extended through the center of the dome to the floor below. Presumably gears or belt wheels attached to that shaft furnished power to various axles and gear trains which drove the mill stones and other machinery in the mill, as well as the machines in the shops of the attached manufacturing plant. Some of the smaller axles and gears were made of metal but all of the large ones were made of wood by the craftsmen from Sweden.

When the customer drove his wagon load of grain into the basement driveway of the mill, he not only was sheltered from the weather but also found other conveniences. By means of a cord attached to a bell he could announce his arrival. A table of market prices and mill charges was placed where he could consult it without dismounting. By means of a speaking tube he could make his wants known to the miller on one of the floors above. He even was aided in unloading his wagon by an elevator which the miller could lower to receive the grain and to transfer it to either a storage bin or to the first step in the grinding process. The elevator also could be used to lower the sacks of flour, meal, or bran which the customer received for his grain or bought with cash.<sup>38</sup>

The Lawrence windmill was equipped with two pairs of mill stones, one used to grind

wheat the other to grind corn. The stones are said to have come from France, which is not unlikely, as French buhrs were considered the finest available and were widely used in the United States in this period. These heavy stones are said to have been mounted on the first floor, the sifting and bolting devices on the second floor, and the grain storage bins in the basement. If, as seems likely, the grain cleaning devices, including the frequently mentioned smut machine, were on the second floor, the flow of grain through the mill would correspond to that of other small mills of that period. The grain was raised from the farmer's wagon, or from a storage bin, to the second floor where it was cleaned and then flowed by gravity to the stones on the floor below. The grist from the stones was, in turn, elevated back to the second floor where it was processed through the sifting and bolting devices. The flour, corn meal, bran, and other products then returned to the first floor where they were sacked and placed in storage. The third floor seems to have been entirely taken up by the gears.

We do not know how much wind it took to turn the mill wheel. Evidence already has been cited that a stiff breeze was sufficient to operate one run of stones with only half of the canvas spread. It seems reasonable, then, to assume that with a good breeze and all canvas up both runs of stone could be operated at the same time. It also may have been possible to grind grain and provide power to the plow factory at the same time. Most likely the proprietors had this in mind when they built such a large windmill. Many descriptions of the mill state that it developed 80 horsepower in a 25 mile-an-hour wind, or when it was turning at 13 revolutions per minute.<sup>39</sup> We also read that there was sufficient wind to run the mill about half of the time. Contemporary evidence on this matter comes from Prof. (later Chancellor) F. H. Snow of Kansas University who wrote in 1867 that: "There is enough wind to keep them [the mill fans] turning on the average about 10 hours out of the 24. At this institution, wagons and ploughs are made and grain is ground into meal and flour. The proprietor is a Swede who

37. Some descriptions mention a chain and windlass arrangement in connection with the dome-shifting apparatus. Available photographs reveal only a simple crank and wheel.

38. This description follows that found in several newspaper clippings and magazine articles, all of which seem to be derived from the article by George R. Crissman, previously cited.

39. The earliest reference found for the 80 horsepower figure dates to 1879 so could have been obtained from the proprietors.—Johnson and McKinney's *Annual City Directory*, 1879, p. 36.



says this is the first windmill ever erected in this country for such heavy work."<sup>40</sup>

While the mill was being built the figure of \$12,000 was quoted as its expected cost.<sup>41</sup> Most other sources say that it cost \$9,700 to complete the mill. The origin of that figure and whether or not it included any of the cost of the later construction of the plow factory is unknown.<sup>42</sup> We also don't know how the proprietors financed this sum, except for the \$4,000 loan from J. C. Trask which, after his death in Quantrill's raid, was assigned to Robert S. Garratt by George A. Banks, administrator of Trask's estate.<sup>43</sup> Andrew Palm may have had some savings and John Wilder undoubtedly raised some cash by selling his interest in his partnership with James Blood. Although the construction of the mill was a success, the proprietors lacked cash and may have been unable to meet the interest payment due in 1864 on the \$4,000 note held by Mr. Garratt. Early in 1865 Anna M. and John H. Wilder deeded their interest in the north half of lot 45 on Massachusetts street to his sister Lucy M. Woodward; in return she paid \$2,500 on the note. As security for the remaining \$1,500 due to Garratt, the Wilders mortgaged 25 acres of their land adjoining the mill site.<sup>44</sup>

When the windmill first opened for business in June, 1864, only one run of stones was ready for use and it was used only to grind corn. By mid-February, 1865, the second run of stones was in operation. A new advertisement appeared in the newspapers, under a large heading "WIND MILL," to inform farmers that Wilder and Palm were "... now prepared to make as good flour and meal and as much to the bushel of wheat and corn as any mill in the state and for less toll." They also advised their customers that they were operating a new corn sheller which provided a cleaner product at a lower price than could be

had elsewhere, that they had flour and meal on hand for sale or exchange, and that they paid highest cash prices for wheat, rye, and corn.<sup>45</sup>

From this advertisement it is apparent that the windmill already was grinding grain on both a custom and an exchange basis. In custom grinding the farmer waited while his grain was ground and took home the flour, corn meal, and other products milled from his grain, less the portion, or toll, which the miller took as his payment. Toll rates varied considerably, generally ranging from one sixth to one eighth. In exchange grinding the farmer took flour and other products from the supply kept by the miller in exchange for his grain, thereby eliminating the wait at the mill while his grain was processed. A mill could operate successfully on an exchange basis only if the farmers had confidence in the quality of the miller's product.

Wilder and Palm's mill seems to have been a success from the beginning. They soon began producing their own brand of flour, Lawrence Windmill. A local paper commented in April, 1865, that Wilder and Palm were doing a good business and that their flour was gaining a good reputation.<sup>46</sup> Even so, stories published many years later that patrons came from 100 miles away and that at times there were scores of wagons waiting with corn must be discounted.<sup>47</sup> There were too many mills in the area for anyone to need to bring grain 100 miles for milling. It is possible, though, that some grain was brought as much as 30 miles to be ground and that at times there was quite a line of customers waiting for service. The local competition at this time consisted mostly of the Pacific Mills, which had begun to grind both corn and wheat late in 1864. Brown and Guest's Exchange Mill, which had a distillery attached, seems to have fallen on hard times and Thomas Guest offered it for sale in March, 1865, "at a bargain."<sup>48</sup>

**D**URING 1865 Wilder and Palm constructed facilities to house their carriage and plow factory at the windmill site. While the windmill was being built this enterprise presumably continued to be carried on at the

40. F. H. Snow, letter to his fiancée, Jane Aiken, April 16, 1867 (transcription of Snow correspondence, Kansas University Archives).

41. *Kansas Daily Tribune*, December 27, 1863.

42. The earliest reference for this figure is Andreas-Cutler, *History of Kansas*, p. 330.

43. Office of the register of deeds, Douglas county, "Mortgages," Book E, p. 478. Garratt may be the mysterious Englishman credited with financing the mill in some accounts. Unfortunately his address is not given in any of the legal documents and his name is not found in any of the early Lawrence directories.

44. *Ibid.*, p. 498. Brinton and Lucy Woodward undoubtedly wanted clear title to the north half of Lot 45 because they were planning to erect a new two-story building to house the Woodward drug enterprises.—See the *Kansas Weekly Tribune*, February 2, 1865.

45. *Kansas State Journal*, February 16, 1865.

46. *Kansas Weekly Tribune*, February 23, 1865.

47. *Lawrence Gazette*, undated clipping, Kansas State Historical Society library.

48. *Kansas Weekly Tribune*, March 9, 1865.

site on Vermont street. Once the mill was completed the next step was to combine the two, thus avoiding the payment of rent and taking advantage of the power produced by the windmill. Eventually three buildings were erected: a two-story stone wood-preparation shop, 40 by 60 feet, a one-story frame blacksmith shop, 30 by 70 feet, and a one-story frame "iron room," 26 by 40 feet.<sup>49</sup> These structures abutted on the mill and power from the mill was transferred into one or more of the shops by means of metal shafts which extended through openings in the mill wall.<sup>50</sup> Undoubtedly these shafts bore pulleys at several points from which power could be transferred by belts to various machines used in shaping wood and metal.

Construction of these facilities must have progressed rapidly as an advertisement for the new plant, the Wind Mill Agricultural Works,

appeared on January 25, 1866.<sup>51</sup> In this ad Wilder and Palm described themselves as manufacturers of the best refined cast and German steel plows, cultivators, shovel plows, etc., and of the celebrated Rough and Ready Gang Plow. Furthermore, they had wagons on hand for sale or would make them to order and they would take payment in corn, wheat, or cash.<sup>52</sup> Even before the new plant opened John Wilder had obtained some sizable orders. In October, 1865, a sale of \$500 worth of plows to a firm in New Mexico was reported.<sup>53</sup> Only a month later Wilder returned from a very successful selling venture in St. Louis with an order for 600 turning plows and 600 shovel plows from the U. S. government.<sup>54</sup> This contract, said to have been obtained in competition with manufacturers from several Western states, was entered into by the Southern Superintendency of the Indian Service to provide

49. Andreas-Cutler, *History of Kansas*, p. 330.

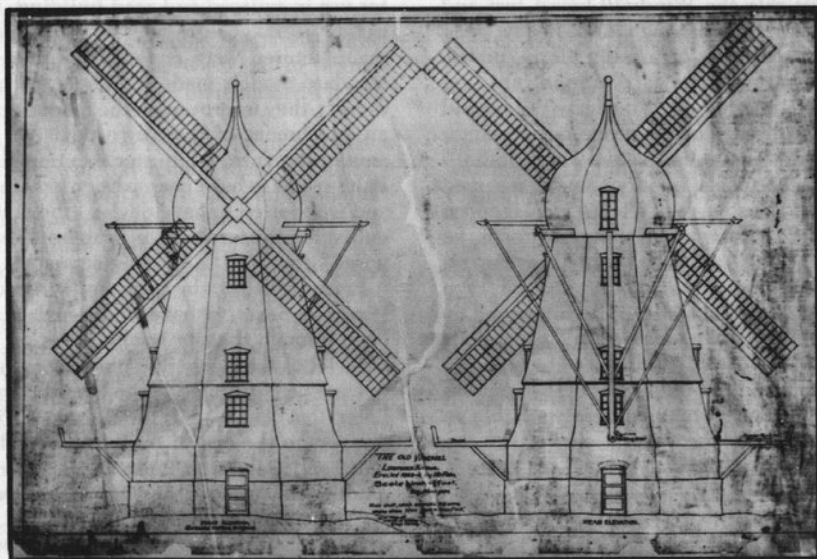
50. Based on the examination of old photographs of the mill. One clearly shows shafts bearing pulleys protruding through a hole near one of the doors of the mill. This photograph was taken long after the mill ceased running and after the attached buildings had been removed.

51. *Kansas Weekly Tribune*, January 25, 1866.

52. The combination of a mill and a machinery factory obviously had advantages in doing business with farmers.

53. *Kansas State Journal*, October 6, 1865.

54. *Kansas Weekly Tribune*, November 2, 1865.



George J. Hood made this scale drawing of the front and rear elevations of the Lawrence windmill in January, 1904. Using the drawing the author has figured that the point of the dome or cap was 64 feet above ground level; the foundation was 32 feet across; and each of the four arms was 34 feet long. The arms, with a total sweep of 68 feet, had lattice-work vanes six and a half feet wide with canvas sails stretched across them to catch the wind. Constructed of native timber, the windmill was octagonal in shape and stood on a foundation of rough-dressed stone.

plows to various Indian tribes. The Wilder and Palm firm was described by the newspaper as having ample facilities for this type of work and as already doing a large business in manufacturing plows and wagons.

On March 1, 1866, Anna M. and John H. Wilder granted a one-half interest in the three acres of land on which the Wind Mill Agricultural Works stood to Andrew Palm for \$50.<sup>55</sup> The purpose of this transaction may have been to give Palm an interest in the mill site. It also served to make possible the use of the land by the partnership as security for a two-year loan of \$1,500 from Robert S. Garratt which was signed on the same date.<sup>56</sup> The firm may have needed this additional financing to complete the equipping of the plow factory or to buy raw material needed to meet some of the large orders they had accepted.

During the next year it became apparent that the mill site did not have adequate space for the proper display and storage of the factory's products and that its location was inconvenient for customers and salesmen. Consequently, in April, 1867, Wilder and Palm opened a store at 173 Massachusetts street.<sup>57</sup> It was advertised as having for sale the Windmill-brand turf and stubble plows, the Rough and Ready gang plows, several types of turning plows, prairie breakers, shovel plows, wagons, shingle knives, and other products made by Wilder and Palm, as well as Woolsey's one-horse planter and Tremont's corn cultivator. The Windmill plows had the special honor of having received first prize at the state fair. When a local reporter visited the Wilder and Palm salesroom he wrote of seeing " . . . something near a thousand plows of all kinds, of their own make, that are for sale."<sup>58</sup> He was impressed by the excellent workmanship and materials found in the eight or 10 kinds of plow made by the firm and credited Wilder with the invention of an attachment which made it possible to widen or narrow the furrow opened by the plow.

During the summer of 1867 Wilder and Palm must have devoted their factory almost exclusively to making plows. In May they were said to be selling from five to 15 plows a day.<sup>59</sup> As the season wound to a close in September they were reported to have made 1,200 plows during the year and to have sold 950 of them that summer.<sup>60</sup> According to this story the Windmill Agricultural Works represented a capital investment of \$20,000 and was doing an annual business of \$18,000. Their two-horse stirring plow was singled out as the best in the market. Their average working force was listed as 15 men and the associated mill was said to be capable of grinding 100 bushels of wheat and 200 bushels of corn per day. And, of course, the entire operation was run by wind power.

During this busy year it appears that the proprietors began to diversify the output of their factory. At the Third Annual Exhibition of the Kansas State Agricultural Society, Wilder and Palm won the premium for two-horse harrows and one-horse corn planters, in addition to three kinds of plow.<sup>61</sup> And, within the next year, they went beyond farm implements and began making scrapers and rollers for use in railroad and road building. In most cases we may suppose that the items they manufactured were copied from more-or-less standard models made by others. Frequently, though, they improved on the model by adding an attachment of their own devising; for example, the furrow adjuster mentioned above. Palm seems to have been particularly inventive and is reported to have devised the first riding cultivator, the farm wagon "rub iron," a barbed wire "lifter," and a grading scraper.<sup>62</sup>

Production at the Windmill Agricultural Works appears to have continued at a high level through the late 1860's. In April, 1868, a large lot of their very fine plows were reported to have been shipped to the Seminole nation.<sup>63</sup> Later that same year they shipped 67 road scrapers to the end of the Leavenworth, Lawrence and Galveston Railroad track for use in grading the right-of-way as it was extended

55. Douglas county, "Deeds," Book O, p. 486. This is the first legal document I have seen which uses the name Palm in place of Palmquist. In newspaper stories Palm was used as early as December 27, 1863. Lindquist, *Early Swedes*, p. 265, says that Palmquist changed his name when he was naturalized but does not give a date.

56. Douglas county, "Mortgages," Book F, p. 228.

57. *Kansas Weekly Tribune*, April 11, 1867. The space at 173 Massachusetts, now 929 Mass., undoubtedly was rented.

58. *Ibid.*, April 18, 1867.

59. *Kansas Weekly Tribune*, May 2, 1867.

60. *Ibid.*, September 12, 1867.

61. *Ibid.*, October 3, 1867.

62. Blenda Palm Greenwood, Palm manuscript biography, said only that her father invented these items. Lindquist, *Early Swedes*, p. 266, states that Palm held patents on several of these items but cites no substantiating evidence.

63. *Daily State Journal*, April 3, 1868.



south of Ottawa.<sup>64</sup> And all of this activity was beginning to pay off. In June, 1868, all of the mortgages on the mill property were discharged when the loans from both Robert S. Garratt and Lucy Woodward were paid off.<sup>65</sup> One latter-day observer claims that the windmill paid for itself and earned its owners a return of 12 percent on their investment in its first five years of operation.<sup>66</sup>

THE FINANCIAL success of Wilder and Palm during the late 1860's appears to have made it possible for both partners to build homes near the windmill. The location of the Wilder's residence changed from Kentucky street in 1866 to "south of the windmill" in the 1868 Lawrence directory. This would seem to indicate that by 1868 John and Anna Wilder had built the house near the end of Berkeley (now 10th) street which was the family home for about the next 20 years.<sup>67</sup> The lot which the Wilders sold to Palm in 1865 was just east and down the hill from the mill, at what is now Ninth and Michigan streets. When they built a house on this property is not certain; the 1868 directory, which may be in error, shows them as living west of the windmill rather than east. The 1872 directory lists Andrew Palm as residing at the west end of Warren (now Ninth) street, where he remained for over 30 years.<sup>68</sup>

A few years earlier Andrew Palm had taken another step which helped to identify him as a settled businessman, rather than an immigrant mechanic; he became a member of the Lawrence Unitarian church.<sup>69</sup> No doubt he was influenced in taking this step by the Wilder family, all of whom were members of that congregation. John H. Wilder and his father were among its earliest members, having signed the constitution in 1856.

In the early 1870's the Windmill Agricultural Works was a thriving business, although it may seldom have operated at the pace reached in

the late 1860's. Arrangements were made with "drummers" to advertise and take orders for its wares throughout the state of Kansas, and, possibly, elsewhere. Other facilities, besides the structures already mentioned, appeared at the mill site, a cistern, a paint shop, and a hillside cave used for storage and for drying steamed and bent wooden plow handles and other parts over a fire.<sup>70</sup> The downtown sales office, which had been in rented quarters since its opening in 1867, was moved to 116 Massachusetts in 1872 when Wilder and Palm bought the south half of Lot 54 from Luther and Harriet Pease of Hartford, for \$7,500.<sup>71</sup> This acquisition was paid for with \$1,000 cash and a promissory note for \$6,500 due on March 19, 1885, with interest at 10 percent. As security for this 13-year note the Wilders and Palms gave a mortgage on both the south half of Lot 54 and the three-acre windmill site.<sup>72</sup> Why it was necessary to give security beyond the real estate which had just been bought is difficult to understand, particularly since the mortgage provided that insurance of at least \$4,000 had to be maintained on the building on the lot purchased. In any case, this transaction, entered into with optimism based on the expected continuation of high sales and production, eventually played a considerable part in the demise of the enterprise.

The need for warehouse space close to shipping facilities led Wilder and Palm to obtain a warehouse at the east end of Henry (now Eighth) street near the Santa Fe tracks some time in the early 1870's.<sup>73</sup> This made it easier to ship their products, which frequently were dispatched in carload lots, and also provided space for the storage of raw material. In addition to the farm and road machinery which they manufactured, Wilder and Palm continued to handle implements which they did not make, such as reapers and mowers, and things like garden seeds, castor beans, flax seeds, etc.<sup>74</sup>

WITH ALL the activity being carried on in the Wilder and Palm enterprise, how many men did it employ? Reliable figures are

64. Middleton, *Manufacturing in Lawrence*, p. 36.

65. The debts to Robert S. Garratt were discharged on June 20 and June 22, 1868. The debt to Lucy Woodward was discharged by B. W. Woodward on September 21, 1868, as Lucy had died on July 25, 1865.

66. Middleton, *Manufacturing in Lawrence*, p. 35.

67. The Wilder house stood approximately on the same site as the large house built by Gov. W. R. Stubbs in 1906 which the Sigma Nu fraternity has occupied for many years.

68. The Palm home on Ninth street was razed in 1957.—*Lawrence Journal-World*, May 18, 1957.

69. Cora Dolbee, "A History of the Lawrence Unitarian Church" (manuscript), p. 193.

70. Middleton, *Manufacturing in Lawrence*, p. 36.

71. Douglas county, "Deeds," Book 6, p. 530. The address 116 Mass. St. is now 818 Mass.

72. Douglas county, "Mortgages," p. 415.

73. Although the warehouse is frequently mentioned in contemporary sources, no evidence has been found that Wilder and Palm owned the land on which it stood. Possibly it was rented on a long-term lease.

74. See advertisement in the *Kansas State Journal*, April 2, 1868.



As the windmill business prospered, both partners built homes near the windmill site. This house, which was built by John and Anna Wilder by 1868, was the family home for about the next 20 years. The Wilder house stood approximately on the same site as the mansion built by Gov. W. R. Stubbs in 1906, and which the Sigma Nu fraternity has occupied for many years. Photograph courtesy of the Watkins Community Museum, Lawrence.

hard to come by. Accounts written long after the mill ceased to run mention a figure of 75 men at peak periods but give no contemporary source for that figure. Estimates of average employment published while the mill was operating include the figure of 15 in 1867 mentioned above, a statement in an 1880 summary of Lawrence businesses that 22 men were employed, and the figure of 25 quoted by the Andreas-Cutler history in 1883.<sup>75</sup> A review of the Lawrence directory for 1872, which gives the place of employment for many of the town's residents, resulted in the identification of 13 employees of Wilder and Palm, excluding the proprietors and their families.<sup>76</sup> From these fragmentary figures it seems reasonable to estimate that the number of men working for Wilder and Palm varied from 15 to 30, depending on the season and the economic condition of the farmers.

Although we have no contemporary account of the work performed in the Wilder and Palm factory, it is possible to surmise the major activities from such information as the products made and the occupations listed for the workers. We know that most farm machinery made in the 1865-1885 era was a combination

of wood and iron components. Handles, beams, tongues, and other large parts generally were made of wood, while plowshares, cultivator shovels, control levers, etc., were made of iron or steel. Wagons, of course, were practically all wood except for the wheel rims, or tires. Thus, the shaping of wood, including steaming and bending, was probably the largest single task performed by the employees of Wilder and Palm. Undoubtedly the wood craftsmen had the use of saws, drills, lathes, and, possibly, planers powered by the windmill. The blacksmiths had their own building in which to fabricate the iron portions of the machines. Their power equipment must have included drills, grinders, saws, and trip-hammers, and they may have had lathes and power shears as well. Besides blacksmiths, the metal workers listed in 1872 included a plow polisher and a chain maker. Another major occupation, painting, had its own building according to some accounts. Each finished piece of machinery had to be painted or varnished and major items, such as wagons and plows, usually received a little decoration which frequently incorporated the brand name and the manufacturer's name and address. Two painters were listed among the Wilder and Palm employees in 1879.

Other portions of the enterprise also required hired help. John Wilder, who we pre-

75. Special edition, *Lawrence Daily Journal*, January 1, 1880; Andreas-Cutler, *History of Kansas*, p. 330.

76. *Lawrence City Directory* (Corbett, Hoye & Co., 1872). This is the only directory of that era which consistently gives place of employment.

sume spent most of this time at the sales office on Massachusetts street, must have had the assistance of one or more clerks. Both a book-keeper and a clerk are listed in the 1872 and 1879 directories. Andrew Palm undoubtedly spent his days supervising the factory and the mill. One of the Swedes brought over by Palm to help build the mill, Ernest Manson, was listed as a miller in both 1872 and 1879.<sup>77</sup> Except for rush periods, he may have been able to run the mill with only part-time help from other employees. The warehousing, shipping, and receiving of manufactured items and raw materials also required considerable effort. In 1872 two men were identified as "plow stockers." With some additional help during peak periods, we assume they took care of warehousing and shipping the things produced by Wilder and Palm and the other machinery, seeds, etc., stocked and sold by the firm.

After the 1860's the windmill is not listed in the Lawrence directories under flour mills, although the Wind Mill Agricultural Works is to be found under the "agricultural machinery" heading. There is considerable evidence, though, that the mill continued to grind grain. In 1871 Wilder and Palm exhibited a sack of flour of their manufacture in the competition at the Douglas County Fair.<sup>78</sup> As has been mentioned one of their employees was listed as a "miller" in both 1872 and 1879. When the firm was incorporated in 1880 one of the objects of the new business was the conduct of a grist mill.<sup>79</sup> A newspaper advertisement in 1882 stated that the "old wind mill" continued to carry on a general milling business and that the proprietors paid the highest market price for wheat or corn.<sup>80</sup> Even as late as 1883 Andreas-Cutler stated that the flouring mill was operating and doing a custom business.<sup>81</sup>

The evidence cited above leads us to conclude that the windmill was used as a grist mill

well into the 1880's. Other evidence warrants the further appraisal that milling operations were only a minor part of the Wilder and Palm enterprise after the early 1870's. This conclusion rests primarily on the fact that its capacity was never increased beyond the initial installation of two sets of mill stones. Within two years after the windmill opened for business in 1864 the milling industry in Lawrence began to expand rapidly. In addition to the Pacific Mills, Orlando Darling opened the Delaware Mills in North Lawrence in 1866 and the old Blood mill was reopened early in 1867 as a woolen mill with a grist mill attached. Surrounding communities also boasted new or reopened mills at this time; among them were Eudora, Clinton, Baldwin, and Twin Mound. Both the Delaware and the Pacific Mills were enlarged and improved in the 1870's and, late in the decade, the Douglas County Mills were opened by Gower Bros. and Houghtellin.<sup>82</sup> By 1880 the windmill with its two runs of stone was completely outclassed. The Douglas County Mills had 12 runs of stone and claimed to be able to grind 1,500 bushels of grain a day, the Pacific Mills had four runs operating and capacity to add three more, and S. B. Pierson was running a roller mill, the first mill in Lawrence to use the new metal rollers which soon made grinding with mill stones obsolete.<sup>83</sup>

**D**URING the middle and later 1870's Wilder and Palm continued to be active in the manufacturing of farm machinery although little notice concerning this business can be found in the local newspapers. The classified section of Lawrence directories for 1875-1876 and for 1879 list Wilder and Palm as producers of "agricultural implements." The 1879 directory also has an entry for the Lawrence Plow Company, under the proprietorship of Wilder and Palm, and describes it as utilizing an 80-horsepower windmill to furnish power for the manufacture of general agricultural implements.<sup>84</sup> Obviously this is the Wind Mill Agricultural Works under a new name but its use seems premature as the Lawrence Plow

77. The interesting question of what happened to the other Swedes brought to Lawrence by Andrew Palm seems impossible to answer. Penquist, the chief millwright, was never listed in a Lawrence directory and probably returned to Sweden when the Lawrence job was finished. Some of the others may have accompanied him while others stayed. Nine of the 13 Wilder and Palm employees listed in the 1872 directory had Scandinavian names but are not necessarily members of the original group as there were other Scandinavians in the area.

78. *Kansas Weekly Tribune*, September 14, 1871. Orlando Darling won the premium for the best 100 lbs. of flour.

79. See p. 161.

80. *Lawrence Daily Journal*, August 22, 1882.

81. Andreas-Cutler, *History of Kansas*, p. 330.

82. All three of these mills obtained their power from the Lawrence dam. The Douglas County Mills used direct water power while the other two obtained their power from the mechanical cable system.

83. *Lawrence Daily Journal*, January 25, February 4, and March 7, 1880.

84. Johnson and McKenney, *Annual City Directory*, 1879.





Construction of the mill was completed in June, 1864, and Wilder and Palm advertised they could grind grain on both custom and exchange bases. Later three buildings were added to house their factory operation, and by June, 1866, the proprietors' Wind Mill Agricultural Works was manufacturing plows and wagons with an average work force of 15 men. Although the wind was a cheap source of power, it was not reliable, with only enough wind at the site on the bluff west of Lawrence to run the mill about 10 hours out of the 24. After the early 1870's the milling operation was a minor part of the enterprise as new technology and improved transportation gradually made the grist mill obsolete. In 1885 the business, by then incorporated as the Lawrence Plow Company, could not compete with mass production facilities and went into receivership. The Lawrence windmill, as the first wind-driven mill in Kansas and possibly the only one that furnished power to a factory of any size, probably gained its greatest fame after it ceased to operate. The once-proud monument of early day business enterprise became a community symbol and landmark, a place for picnics and subject for picture postcards. But even that was lost, when on April 30, 1905, the picturesque ruin was completely destroyed by fire, started, some said, by carelessness akin to vandalism. This photograph was probably taken in the 1870's.

Company wasn't incorporated until the next year.<sup>85</sup>

The products of the Wilder and Palm factory, whatever its name, continued to win prizes at local fairs. In 1876 they received first premiums for several kinds of implements at the Douglas County Fair including a two-horse plow, a subsoil plow, a one-horse shovel plow, and a two-horse cultivator.<sup>86</sup> The firm also won first premiums for a number of other exhibits including a churn, an iron fence and gate, a hydraulic ram, a window shutter and fastener, and weather stripping.<sup>87</sup> Some of these items undoubtedly were made elsewhere and merely were retailed by Wilder and Palm but others may indicate that Wilder and Palm ventured into the production of small hardware items when the demand for farm machinery was low. In a similar competition in 1879 the Lawrence Plow Company (Wilder and Palm) won diplomas for several kinds of plows, a road scraper, a wagon with a patent end-gate, a set of garden tools, and portable engines.<sup>88</sup> The engines undoubtedly were not of their manufacture but presumably the others were. The active promotion of its wares by preparing sizable exhibits at these fairs, and possibly others, seems to be good evidence that Wilder and Palm were continuing to manufacture and sell farm machinery and other products throughout the 1870's.

On June 12, 1880, articles of incorporation for the Lawrence Plow Company were filed with the Kansas secretary of state. John H. Wilder and Andrew Palm were among the five incorporators and were two of the three directors appointed for the first year.<sup>89</sup> The purpose of this corporation was the manufacture and sale of plows, wagons, and other agricultural implements, the conduct of a general hardware store, and the conduct of a merchant and grist-

milling business. Capital stock of 1,000 shares at \$100 each was authorized and the principal place of business was designated as Lawrence. Presumably Wilder and Palm turned over the assets of their partnership to the new company in return for shares of stock. Other shares were offered to the public to obtain additional funds. The amount of paid-in capital was stated, several years later, to have been \$44,400.<sup>90</sup> To Wilder and Palm the chief benefit of the corporate form of organization was that it limited their liability to the amount of their investment. Thus, in case of bankruptcy, creditors could not take any of the other assets they might own, such as their homes. Whether the act of incorporation signals that the business already was in decline or that the proprietors were seeking additional capital to take advantage of new opportunities is difficult to say.

At the beginning of 1880 a summary of Lawrence businesses described Wilder and Palm as the manufacturers of scrapers, plows, wagons, and other machinery and stated that, as there was enough wind to run the windmill only about half of the time, the proprietors were putting in a steam engine to supplement their wind power.<sup>91</sup> So far as we know, this was never done. Toward the end of the year at a fair held in Bismarck Grove near Lawrence, the Lawrence Plow Company exhibit was said to " . . . make a good display and the Wilder wagon wears a blue ribbon. They occupy a large space and it is well filled."<sup>92</sup>

One commentator has stated that the Lawrence Plow Company declined rapidly after 1880 but does not provide any firm evidence to that effect.<sup>93</sup> Outward evidences of prosperity continued to appear throughout the early 1880's. An advertisement published in 1882 seems to belie the suggestion that the company's manufacturing efforts had diminished.<sup>94</sup> The list of items manufactured seems longer than ever and includes various kinds of plows, scrapers, cultivators, rakes, wagons, rollers, and harrows. Another long list of the items

85. An earlier Lawrence Plow Company was incorporated on February 19, 1874.—See KSHS Archives, "Corporation Charters," v. 5, p. 554. John H. Wilder was one of the applicants for the charter but was not on the first board of directors and the windmill plant does not appear to have been involved. Newspaper stories indicate that the intended purpose of this enterprise was to purchase and operate the Kimball Bros. foundry and machine shop, long the leading machine shop in Lawrence. After an announcement to this effect in April, 1874, and a call for funds from the stock subscribers, this corporation disappears from view.—See *Kansas Tribune*, March 26 and April 23, 1874.

86. *Republican Daily Journal*, October 10, 1876.

87. *Ibid.*, October 6, 1876.

88. *Western Home Journal*, Lawrence, September 11, 1879.

89. KSHS Archives, "Corporation Charters," v. 11, p. 40. The other incorporators were P. J. Peterson, Albert Neese, and Mary J. Sherwood. Peterson was the third member of the first board of directors and may have been Mrs. Palm's brother.

90. *Lawrence Daily Journal*, August 1, 1885.

91. *Ibid.*, special edition, January 1, 1880.

92. *Kansas Daily Tribune*, September 18, 1880. Of significance to the fate of the Lawrence Plow Company were the displays at this fair of such enterprises as the Moline Plow Works, the Oliver Chilled Plow Company, J. I. Case and Company, and the McCormick Company.

93. Middleton, *Manufacturing in Lawrence*, p. 37.

94. *Lawrence Daily Journal*, August 22, 1882.

made by others which they sold includes binders, mowers, engines, pumps, windmills, scales, and threshing machines. Two descriptions of the company published in 1883 attest to its continued activity in the manufacturing field. The first, a "booster"-type publication mentions the 80-horsepower gristmill with attached factory, the sales office on Massachusetts street, the large warehouse on Henry street, and a long list of items manufactured.<sup>95</sup> Andrew Palm was cited as president of the firm and John H. Wilder as treasurer. Annual sales were stated to be \$75,000 and the amount of stock issued to be \$25,000. The second 1883 publication, the Andreas-Cutler *History of Kansas*, provides considerable detail concerning the buildings and the windmill and states that the value of the implements produced annually was \$50,000.<sup>96</sup>

Despite these optimistic estimates and some evidence that production and sales continued at a good pace, all was not well with the Lawrence Plow Company. Frequent loans from both Wilder and Palm, many of which were not repaid, appear to have been necessary to keep the company in operation. The large debt originating from the purchase of the building in downtown Lawrence in 1872, was coming due in March, 1885. No funds were being accumulated to meet this note, which was secured by mortgages on both the Massachusetts street and the windmill properties, or any of the other debts which had piled up. This unfortunate state of affairs came to a head in the first half of 1885, possibly due to a default on the note. On July 31 the company was placed in receivership and its assets were turned over to Nathan Henshaw, temporary assignee for the creditors. Liabilities totaling a little over \$40,000 were listed in one newspaper account.<sup>97</sup> Chief among them were notes and interest owed to John H. Wilder of \$9,397, to Andrew Palm of \$3,645, to Luther Pease of \$6,825, and to the Merchants Bank of \$7,025. Other liabilities included a deposit account of \$6,745 due to the

Wilder heirs and many other small notes and accounts.<sup>98</sup>

A meeting of the creditors was held on August 26. They were unable to agree on a permanent assignee and left the matter up to Judge Benson who appointed Nathan Henshaw as receiver and S. J. Churchill, W. H. Kemmerer, and Charles Chadwick as appraisers.<sup>99</sup> Two days later these appraisers estimated the assets of the Lawrence Plow Company to total \$22,791.<sup>100</sup> Obviously all of the claims against these assets could not be met and only Luther Pease, or rather his heirs, appeared to be in a good position to get his money back. We do not know whether the mill and plow factory continued to operate after the date of receivership. If not, that explains why the mill is generally said to have last turned its wheels, July 31, 1885.<sup>101</sup>

During the next two years the receiver gradually liquidated the assets of the company. Some, such as the inventory of manufactured goods and of items purchased for sale, were readily saleable. Undoubtedly there also were raw materials, tools, and manufacturing equipment which could be converted to cash. The real estate, being mortgaged, was a different matter. The executor of the estate of Luther Pease on March 26, 1887, obtained a judgment of nearly \$9,000 against the Wilders, the Palms, the Lawrence Plow Company, and others. By December, 1887, everything saleable must have been stripped from the windmill property and the Massachusetts street store. The final episode in the life of the Lawrence windmill as a business enterprise took place at 1:00 p.m. on December 6, 1887, at the front door of the Douglas county courthouse when Sheriff Samuel H. Carmean sold the two properties to the highest bidder. The first, the south half of lot 54 on Massachusetts street, went to H. J. Snyder for \$4,510.<sup>102</sup> The second, three acres of land on Warren street with appurtenances including the windmill, was bought by Horace C. Pease for \$800.<sup>103</sup> No information has been found on how much the

95. *The Leading Industries of Lawrence, Kansas* (Commercial and Manufacturing Publishing Co., 1883), pp. 26-27.

96. Andreas-Cutler, *History of Kansas*, p. 330. The first firm is called the Lawrence Agricultural Works, an erroneous combination of the old and new names. It should be noted that neither of the 1883 sources mentions a steam engine as a source of power for the mill and plow factory.

97. *Lawrence Herald-Tribune*, August 1, 1885. On the same date the *Daily Journal* estimated the liabilities at \$30,000 and asserted that all creditors would be paid and that there even would be a return on the capital investment.

98. The Wilder heirs were the legatees of Anna Wilder who had died on April 24, 1874. On December 25, 1880, John Wilder married Amy Fisher.

99. *Lawrence Herald-Tribune*, August 27, 1887.

100. *Ibid.*, August 29, 1887.

101. Some accounts give this date as July 31, 1886, which probably originated as a typographical error.

102. Douglas county, "Deeds," v. 44, p. 636.

103. *Ibid.*, v. 46, p. 30.



company's other creditors received on their claims.

**I**N ACCOUNTING for the demise of the Lawrence Plow Company, a number of factors may be cited. Primary, in my opinion, is the fact that the plow factory was small and basically was a hand operation, assisted by some power tools, at a time when the large farm machinery manufacturers were setting up mass production facilities. The expansion and improvement of rail transportation also contributed by making possible efficient distribution of the output of the large plants being established by Case, Oliver, Moline, McCormick, and others. Furthermore, as has been discussed above, new technology and improved transportation already had made the gristmill part of the operation obsolete. Even though it was still grinding grain in the 1880's, it could not have contributed significantly to the firm's profits.<sup>104</sup>

Another factor which undoubtedly contributed to the decline of the Wilder and Palm enterprise was its continuing reliance on the windmill as its sole source of power. Although a cheap source of power, it was not a reliable one. This was not an insuperable problem for the mill itself, as grain could be stored and then ground when the wind blew. But trying to operate even a small manufacturing plant which had no power when the wind was down must have been inefficient as well as frustrating. The problem seems to have been recognized but the idea of installing a supplementary source of power, mentioned in an 1880 report, apparently never progressed beyond the talking stage.

General economic factors also may have played a part. In the middle 1880's Kansas was still gaining population rapidly but the rate of gain had slowed from that of the 1870's. Furthermore, Lawrence no longer was near the center of the area rapidly being settled with small farms, as it had been in the 1860's and 1870's.

No record exists of what happened to the employees of the Lawrence Plow Company after it went out of business. The two propri-

etors, both of whom must have suffered considerable financial loss, appear to have come out of the affair with their homes and some business connections intact. In March, 1887, while the company's affairs were still being settled, Andrew Palm opened a business at 934 Massachusetts street where he was prepared to shoe horses, repair wagons, buggies, farm implements, and other machines, and sell all kinds of agricultural implements.<sup>105</sup> Thus Palm went back to his former craft of blacksmith and mechanic and also seems to have been able to get enough credit to continue as an implement dealer.

No information has been found on John Wilder's occupation after the Plow Company bankruptcy except the general statement that he was in business. Possibly this means that he returned to dealing in real estate, which he engaged in to some extent in the 1870's. On September 26, 1889, he died of malaria, contracted while on a business trip in Missouri.<sup>106</sup> His widow seems to have moved away from Lawrence and the Wilder home was replaced in 1906 by the large mansion built by ex-Governor Stubbs.

Andrew Palm sold agricultural implements at the store on Massachusetts street for several years. He and his family continued to live in their house on Warren street just down the hill from the windmill. On April 3, 1899, Mrs. Palm took her own life.<sup>107</sup> Shortly thereafter Palm appears to have retired from the implement business but he may have been involved in a stone-cutting firm for a few years after that.<sup>108</sup> When Fowler Shops was completed at Kansas University in 1899, the position of machine shop superintendent is said to have been offered to him but he declined.<sup>109</sup> He survived his mill by only a year and a half, dying on November 5, 1906, of unspecified causes.<sup>110</sup>

105. Lawrence *Daily Journal*, March 18, 1887.

106. *Ibid.*, September 27, 1889.

107. *Ibid.*, April 4, 1899.

108. An Andrew Palm was engaged in a stone-cutting business with Joel Gustafson at 838 New York street for several years in the 1890-1905 period. The Kansas agricultural census of 1895 and the U. S. census of 1900 list two men named Andrew Palm, or A. Palm, at two different addresses, both being the same age and natives of Sweden. This state of affairs also exists in several city directories. In 1902-1903 the second Andrew Palm, who had been listed as living at 838 New York, disappears but the Gustafson and Palm firm, and the Gustafson family, continue at that address. In 1905 the Gustafsons are gone and Andrew Palm is listed as a stone contractor with a business at 838 New York and his residence on Warren street.

109. Greenwood, Palm manuscript biography.

110. Lawrence *Daily Journal*, November 6, 1906.

104. Some observers have held that "the advent of steam" was a cause of the decline of the grist mill and the plow factory. This obviously is rather far fetched as there were steam engines in Lawrence from shortly after its founding and most of the early grist and saw mills in the area were powered by steam.

THE LAWRENCE windmill gained its greatest fame after it ceased to operate. It became the most picturesque ruin in the area and was the subject of innumerable drawings, photographs, and sentimental magazine and newspaper stories. Several generations of Kansas University students used it as a backdrop for picnics and romantic strolls. For the people of Lawrence it was "... a Sunday place or resort for many years. ... It was a grand sight to view the country over from the uppermost windows, and the mill itself has stood a landmark to those approaching Lawrence from any direction for almost half a century."<sup>111</sup> W. H. Carruth, poet and professor of German, proposed that the grounds be made into a public park but, despite all the sentiment about the mill, the necessary funds could not be raised. Col. O. E. Learnard, who owned the property for many years, seems to have been unable to find any use for the old mill or its site.

On Andrew Palm's 70th birthday, April 30, 1905, the late Sunday afternoon quiet in Lawrence was broken at 5:50 p.m. by a fire alarm. Word soon spread that the mill was on fire. The fire department turned out but could do little. First they had to go back for more hose and then their water pressure was inadequate because of the height of the hill.<sup>112</sup> Once the fire, which had started near the top of the structure, took hold on that great mass of well-dried wood there was no stopping it. As a large crowd of townspeople watched, the mill burned to its stone foundation. Although a few may have been glad to see the end of a symbol of the old "backward" days, most expressed a sense of loss. As the *Journal* said, "It will be hard for old timers to imagine Lawrence without the windmill. It will be hard for the people of the city to reconcile themselves to the loss."

111. Lawrence *Daily Journal*, May 1, 1905.

112. *Ibid.* The *Journal* charged the fire to "carelessness akin to vandalism," citing that among the many Sunday visitors were boys with cigars and cigarettes who were known to have climbed to the top floor of the mill.

Shortly after the mill burned, John E. Boodin, a professor of philosophy at Kansas University, bought the two and one-half acres around the charred remains of the mill from Colonel Learnard for \$650.<sup>113</sup> Professor Boodin later moved to California and the land passed to other hands. As late as 1941 some of the mill's foundation, overgrown with weeds and vines, could still be seen.<sup>114</sup> In 1959 the Theta Chi fraternity bought a three-acre tract at Ninth and Emery. When the foundation for their chapter house was dug, the mill's cistern, tool shop, and various articles of equipment were encountered.<sup>115</sup> It seems quite certain that the former Theta Chi house, now empty but being considered for other uses, was built almost exactly on the location of the Lawrence windmill. Although there are apartment buildings on three sides and there are many trees, the site still affords a magnificent view of Lawrence and the Kansas river valley.

The Lawrence windmill met an early community need for a gristmill, produced much equipment for the use of the pioneer farmers and railroad builders, demonstrated the utility of wind power in Kansas, and, finally, became a community symbol and landmark. Its place in the history and the hearts of the people of Lawrence has best been expressed by the following lines written shortly after its destruction:

It was a landmark, a place of history, of song and story. For forty years and more it has stood upon its hill, and has been known to every man, woman and child who lived in Lawrence, or came here. It was practically without value, save as every old and honored thing is of value. Everybody loved it, everybody visited it, everybody remembered it. . . . There is no Old Windmill any more. The glory of Windmill Hill has departed, and with it has gone one of the dearest memories of Lawrence.<sup>116</sup>

113. Douglas county, "Deeds," v. 75, p. 620.

114. Lawrence *Journal-World*, June 28, 1941.

115. Kansas City (Mo.) *Star*, September 28, 1959.

116. Clipping from unidentified Lawrence newspaper, probably early May, 1905.