



The Story of Some Prairie Inventions

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Article Summary: Between 1870 and 1900 the people of Nebraska conducted an experiment in living, a hard-won battle with the land itself. Lacking water, they created windmills. Lacking wood for fences, they planted Osage orange fences and created barbed wire.

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THE STORY OF SOME PRAIRIE INVENTIONS

BY WALTER PRESCOTT WEBB

WHEN Dr. James Olson asked me to speak to the Nebraska Historical Society on the occasion of its seventy-fifth anniversary celebration, he conferred on me an honor of which I am both conscious and proud, and an obligation which requires all I have to fulfill. It is true that I have had some experience in directing an organization such as this, the Texas State Historical Association which is about twenty years younger than yours. I think I know something of the problems that confront a director, and I know something also of the pleasure derived from bringing together those few who devote their time and energy to preserving the fading records and legends of the past. Those of us who devote ourselves to state or county or community history are sometimes made to feel that the work lacks the significance that attaches to more ambitious undertakings. I do not hold that view because I know that all history is local. All places are local to the people thereabout, and only the consequences of what took place give what happened there importance.

I did not come here to tell you about the battles and the bloodshed you have had in Nebraska. You have been fortunate in having few battles and little organized bloodshed within your state, and I trust that your good fortune endures.

Dr. Walter Prescott Webb is professor of history at the University of Texas. This paper was read at the dinner session of the 75th anniversary meeting of the Nebraska State Historical Society, Lincoln, 26 September 1953.

But a battle of great consequence has been fought here in Nebraska and in neighboring states. It seems appropriate that I talk of this battle—of things which your people and my people worked out in the great laboratory of hazardous living. I want to give examples from the approximate date of the organization of this Society. It so happens that in the period from about 1870 to 1900 the common people of this whole region in which you live were conducting in patient silence one of the greatest experiments in living that has ever occurred in this broad land. They were fighting a desperate battle for life and survival, conducting it against great odds, and they were doing it without guns and often with very little butter. In this battle everybody was a private and each his own general. There were no such heroes as Robert E. Lee or Abraham Lincoln. There were no parades, no flags, and no music. There were no hospitals for the casualties. There are no cemeteries set aside for those who perished in that conflict, and on Decoration Day the graves of these unknown soldiers—men, women and children—are in the main unmarked and never decorated with flowers by patriotic organizations.

You must be wondering why you have not heard more of this battle. You have heard more of it than you think, but you may not have noticed it because it was, and it still is, a part of your life. You here in Nebraska are still engaged, as are we in Texas, in Kansas, in the Dakotas, throughout all these western states. If the conflict is less fierce now than it was around 1878, '88, '98, it is because we are the beneficiaries of the victories won by those first campaigners who tackled the enemy almost with bare hands.

I come tonight to talk to you of some things these soldiers of the plains left by the "wheel scarr'd road." I talk of those who fought the plain and the prairie wherein you dwell.

What then is this battle of which I speak? It was in essence the battle of all the people with a land which to them was new and strange. It was the struggle of a people, who in all their history had never lived in this kind of country, learning to live in this kind of country. And

what kind of country is this, and why was it so strange to the early Nebraskan? When your Society was organized in 1878 I daresay that not a charter member of it was born in Nebraska, and few of them in a country in any way similar to Nebraska. They were from another land. They had come out of the East, from a land of tall trees, bubbling springs, running rivers, and practically no grass. For generations their fathers had lived in the forest and had seen the morning and evening sun only through the tracery of the forest's rich green foliage. Those people literally dug their farms out of the woods, and from the ruins of the woods they made what they needed—their cabins, fences, cribs, churns, beds, beehives, horse troughs, baby cradles, and gate hinges. These early Nebraskans were a forest people, and their whole life and their whole way of living had been geared into and articulated with the forests which lay behind them. In that forest their work was hard, but they knew how to perform it. There were few mysteries and unknown quantities in the problems of living. Their civilization stood firmly on three legs—land, water and timber.

It was about the middle of the century and later when these forest dwellers came out of the woods. They left the shade and the comfort and the certainty of a known life and stood appalled in the mighty presence of this strange land, a land without timber, with rarely enough water, a hemisphere of grass with a flat and level floor beneath and an inverted bowl of limitless sky above. They had never seen so far or so little as in this land of vast immensity. It was as if they were on the sea, but they were on the plain.

The plain has moods like the sea . . .
The plain grows dark; like the sea
It holds no shelter.

Of the plains John J. Ingalls said: "Above their receding horizons forever broods a pathetic solemnity, born of distance, silence and solitude." In the same kind of country Hamlin Garland described the sunrise:

The sun up-sprang,
Its light swept the plain like a sea
Of golden water, and the blue-gray dome
That soared above the settler's shack
Was lighted to magical splendor.

But these early comers to Nebraska had too many hard tasks before them to dwell long under the spell of magical splendor created by sunrise of a wet morning on the green and undulating sea of the plain. These early comers were baffled and often beaten by the unsolved problems of the plains. In a land where a furrow could be plowed a hundred miles long, they had no plow that would turn the prairie sod, no rails with which to build their accustomed fences, no logs with which to construct the classic American cabin, no weapons with which to meet the mounted Indians, and they were always short of water.

Their civilization had stood on three legs—land, water, and timber; here two of these legs were knocked out, and they stood on the single leg of land. It is no wonder that they sometimes toppled over in failure. The remarkable thing is the manner in which they worked out their problems and made the radical changes that enabled them—some of them—to stay in the country that we now hold so dear.

In speaking of this Battle of the Plains, I would not have you think that I speak of Nebraska alone. That battlefield was half as big as the nation. It stretched from Mexico on the south to Canada on the north; it was several hundred miles wide, extending from the edge of the eastern woodland into and through the Rocky Mountains. All along the eastern edge of this land thousands of people were engaged in a common struggle. Fortunately, an occasional victory in any part of the country—in Illinois, Kansas, Texas or Nebraska—conferred its benefits on plainsmen elsewhere. The problem of one was the problem of all, and the fruits of success in one place were soon enjoyed in other places.

We need a symbol for the spirit of these people, for these successes, these far-reaching victories. I could find no symbol more fitting than the windmills which by 1878 began to rear their wheels on the far horizons, signaling to man that here was his most precious treasure, cool clear water. The windmill was like a flag marking the spot where a small victory had been won in the fight for water in an



Testimony to the importance of the plow on the plains is the prominent place given it in this photograph of a typical Nebraska sod homestead (Photo from S. D. Butcher Collection.)

arid land. The windmill threw in with nature and capitalized on the least expensive plains commodity—the wind—to produce the scarcest and most valuable commodity—water—at the least possible expense. Life was always tolerable, and often comfortable, as long as the old windmill kept a-turning. The wheel bears some resemblance to a giant sunflower, and it turns into the wind of its own volition as the sunflower turns into the sun. It was as dependable as the wind, and the wind of the plains is more dependable than the rain.

This symbol of the windmill is appropriate here because Nebraska was the very *heart* of the windmill country. Its development was carried out with greater ingenuity here in Nebraska than in any other state I know. And finally, it was a Nebraska citizen and scholar who saw something of interest and importance in what the farmers and ranchmen along the Platte, the Republican, and the Loup, were doing with windmills, and he took the time to make the record of which I shall speak later.

I must remind you again that I am dealing with the changes men were compelled to make when they passed from the woodland of the East into the open plain of the West. I shall deal with the problems incidental to that passage. I shall illustrate with several examples, selected from different plains and prairie states. I deal with a period of about one generation, say from 1840 to 1900, the period in which a woodland people made the passage and learned to live on the plains. The first example has to do with guns, the second with fences, a third with plows, and the last with windmills. What the people had to learn when they came to the plains were new ways of fighting, of fencing, of farming, and of providing water.

I have on this table a long rifle and a Colt revolver, a piece of barbed wire, and a disc plow. These are simple things, but they are highly significant, and each is related to the adaptations that people made when they left the forest to live in this open country.

The first thing the American people had to learn when they came out on the plains was to stand up to the enemies

they found there. These were Indians but quite different from any that the settlers had contended with before. These were Plains Indians, wild, nomadic, fierce and unconquerable. Such were the Comanche, Apache, Cheyenne, Blackfoot, and several others. What was more important, these were horse Indians, and they had developed a technique of fighting on horseback. The American had never had to fight Indians on horseback before because the woodland Indians were pedestrians. The Americans had no weapons suited to fighting on horseback, especially in the Indian style. They had the long rifle, sometimes known as the Kentucky or Tennessee rifle. A specimen of this weapon I have here, and I think you can see without further elaboration that it was designed for a man who had both feet planted on the ground. The Indian carried from twenty to thirty arrows, and he could shoot them so rapidly from a running horse that he could keep one in the air all the time. The American with this long rifle had but one shot, and when that was spent it took him a long time to reload this cap-and-ball rifle. In this interval he was quite helpless while the Indian was in full command of the situation. It is clear that the American needed a weapon that could be used on horseback, one that carried more than a single shot.

The need for this weapon was first felt most keenly in Texas, most keenly there because the Texans were among the first to venture living in the edge of the land where the Comanche raided and ravaged the settlements on horseback. The man who provided the gun for the plainsman, for the horseman, was Samuel Colt. He invented a multiple shot revolving pistol carrying five or six shots about 1830, began manufacturing it in 1832 at about the time the Texans were developing their bitter conflict with the mounted Indians. Colt had no idea of creating a weapon just for Texans but thought he had made one suited for the military men of the United States. In this he was at first disappointed. The army condemned his weapon, the people of the United States were not yet much in contact with the Plains Indian, had not become horsemen, and would not buy the guns. By accident some of them found their way to the Republic of

Texas and into the hands of a small group of Texas Rangers stationed on the border to guard against the incursions of the mounted Comanches. The Texas Rangers under Jack Hays tried the revolvers first in the Indian battle of the Perdernales, the first battle in which the American fought Plains Indians on horseback. But the little Republic and the people of Texas were too poor to buy many of Colt's guns, and nobody else would buy them at all. The result was that Samuel Colt went into bankruptcy in 1842. The Mexican War broke out in 1846, and immediately the Texas Rangers enlisted under Col. John Coffee (Jack) Hays. Hays and a few of his men still had the multiple shot pistols, but the rank and file had none. The rank and file demanded revolvers and were so insistent that an order went up to Washington for one thousand revolvers, two for each of the five hundred Texas Rangers. Colt had been in bankruptcy for four years, had got rid of all his weapons, and had no money to make more. When the government finally found him, he was dressed in a long black coat and a tall top hat, standing on the back end of a medicine wagon selling nostrums to the public. He was pulled off that wagon by the Indian fighters of the plains who had reached from the deserts of Texas into the verdant land of New England to rescue Samuel Colt from obscurity, to make him rich, and to make him famous throughout the open country where cowboys and peace officers rode horseback in their daily work. The men on horseback—cattlemen, cowboys, peace officers, and the American cavalry—took over the open country to subdue the Indians. They took the country but held it briefly because the farmers were beating hard at the eastern gate. The farmers had already pushed into the eastern edge of the plains, into the fertile prairie land, but they were stopped because they had nothing with which to fence their crops from the cattle, their own cattle and their neighbors'. Farming was impossible without fences, and the praiemen, having outrun the forest and the rocks, had nothing with which to make a rail fence or a stone wall, and they knew no other fence.

Along the edge of the open country, of which eastern Nebraska is a part, men began experimenting with every conceivable substitute that could be converted into an economical fence—one they could afford to build, a fence without rails and without rocks. They tried hedges made of rose bushes, mesquite, prickly pear, and finally of Osage orange, an indigeneous, thorny, stubborn, and hardy plant. Nurserymen handled the plants, and Osage orange seeds sold for five dollars a pound or fifty dollars a bushel. You still have survivals of these hedges on your prairies, reminders of the efforts of your fathers to make a fence for a treeless land. What men learned from the use of hedges was that you had to have thorns to turn cattle, and the idea of a thorny fence was basic in the solution of the fence problem by western farmers.

Three New England farmers who had moved to the prairies of Illinois took the idea of the thorn and converted it into a fence that was cheap enough and effective enough to meet the needs of a treeless land. Of the thorn they made a barb—more barbaric than the thorn. They made barbed wire, and they first called such a fence a thorn wire fence.

The invention did not come out of a formal laboratory. Yet it came out of that great frontier laboratory where thousands of little men were fighting the Battle of the Plains. We see them stumbling from one thing to another, trying this, trying that, and finally these God-fearing transplanted New Englanders with keen noses for the main chance stumbled upon the solution so essential to the treeless half of the continent.

The three men were Joseph Glidden, Jacob Haisch, and Isaac Ellwood—and you can tell by their names—Joseph, Jacob, and Isaac—that they had background. It was only after they made fortunes that they became converted sinners.

The story of how they got the idea of a barbed wire cannot be known with accuracy because these farmers did not make written records. But after they got rich, they began suing one another, hired lawyers who were able to prove almost anything in court, and we have sworn testi-

mony for whatever it is worth. I will not confuse you with the testimony.

A man named Rose conceived the idea of making a cheap fence by using strips of wood studded with nail points. These strips he attached to posts with the sharp nails facing the stock. About 1872 he exhibited this device at a county fair at DeKalb, Illinois, and all the curious and jealous farmers came to examine it to see if it was practical. Among them were Joseph Glidden, Jacob Haisch, and Isaac Ellwood. It was later claimed that all got the idea of a thorn fence from the Rose exhibit. All we know for certain is that within a year all three men were making some form of barbed wire.

Glidden says that he got the idea because his wife was pestering him to keep the dogs out of her flower beds where they went on hot days to scratch out a cool place to lie down. He says he put a smooth wire around the beds, and then tried putting rude barbs on it. But the barbs would slide laterally or would turn on the smooth wire and were not effective. You have noticed that all barbed wire is made of two strands twisted. You would think anyone would know that the way to make barbed wire is to twist two strands, but this simple thing had to be learned. I may say that the twisting is essential and makes the wire a sort of spring which contracts and expands with heat and cold. Only twisted wire will stay tight in all weather. The twisting serves the further purpose of holding the barbs in place and keeping them from rotating. Glidden says that he learned about this twisting by accident. He picked up some tangled smooth wire, and in a flash it occurred to him that twisting would be a good idea. He fastened two wires to the shaft of a grindstone and called his wife to turn the crank, while he held the wires. He had a hired man named Andrew Johnson who told about the first barbs. He said that at night, after the day's work was done, they made the first barbs. They used an old wall coffee mill for this purpose. In the shaft of the coffee mill they fixed two pins, one in the center, one off-center. They inserted a wire between the pins and gave the crank a complete turn to form a circle.

Then they cut the wire to finish the barb. With a bucket full of barbs a boy would climb a windmill tower and thread the barbs on strands of greased wire. The barbs would be spaced and set by a hammer blow and then the two strands, one with barbs, and one without, would be twisted to hold the barbs in place. They sold the wire as fast as they could make it—at twenty cents a pound. All this happened in the year 1873, five years before this Society was formed. By the time this Society was formed, Joseph, Jacob, and Isaac were all rich; the United States Steel Corporation took over the making of barbed wire, and all of Nebraska and all of the Great Plains country were going under fence. The farmer could fence his homestead, and the cattleman could, for the first time, fence his twenty- or sixty-section ranch.

But even with the invention of a practical and economical fence, the Battle of the Plains was not won. When these farmers came out on the plains they had no plow that would turn the prairie sod. The plow they brought from the eastern woodland, from the red hills of Georgia and the rocky lands of Vermont and Massachusetts may best be described as a dirt pusher. It had a blunt point and a flat wing or share that did not turn but simply pushed the loose earth over towards the previous furrow. Now the prairie and plains earth was not loose. It was fertile and hard, and it was bound together in a tight mass by millions of grass roots. To plow it was like plowing a Brussels carpet six inches thick. No dirt pusher could even stay in the ground. The matted sod of the plains could not be pushed. It had to be cut by a long sharp point, a long point carried back to the long, bent share, and finally this ribbon of matted earth, flowing in large blocks from the plains plow, had to be turned upside down into the previous furrow.

I wish that the invention of this plains plow had brought on the lawsuits that barbed wire brought so that the lawyers could have got some perjured testimony for the historians to use as an original source. The real story of this innovation in plows lies in the graves of the prairie blacksmiths who stood over their forges to hammer out the points and shares that would turn the matted soil of the

plains upside down. It would, I am sure, be the same old story of stumbling, experimenting by hundreds of blacksmiths and thousands of farmers until the shape and the character of the plow were discovered, accepted, and perfected. Once it became perfected the big farms unrolled like black rugs laid in fields of green or brown grass.

Second to the turning plow was the disc which became so important in cultivating the expanding fields of the West. It was my good fortune to get on the trail of how the disc plow was invented, to find the son of the blacksmith who made it, and even to find his original disc plow with the anvil and hammer marks on it. It is here for you to see, one of the most valuable artifacts left from the Battle of the Plains. I shall relate the story as I have been able to piece it together.

I was conducting a contest in local history, offering prizes to the high school student who wrote the best essay on his local community. One of these essays came in from the prairie town of Clifton, Texas. It was about a Swedish settler named Ole Ringness who was a leader in his community. He was also a blacksmith. A letter came one day from far-off Sweden saying that another contingent of immigrants was coming to Texas. They would land at Galveston, and they wanted some of their friends to meet the boat. Ole Ringness was selected to drive to Galveston and conduct the party to their new home. It was summer time. The drought was on as it often is in western Texas and western Nebraska. Ole's wagon was good, but the tires had become loose in the drought, and he had shrunk them so much that one wheel, a front wheel no doubt, had become badly dished. To say that a wheel is dished means that it has taken the form of a large plate or soup bowl. Naturally, Ole Ringness kept an eye on that bad wheel, and he noticed that as it unrolled the dreary miles, it threw the earth aside, making a furrow behind. Now when one drives a wagon and team two hundred miles, he has a great deal of time to think. Ole Ringness did a lot of thinking. Would it be possible, he asked himself, to make a plow out of a dished wheel? And would it not also be possible to set a series of

these dished wheels on a common axle and break a strip of land two feet or ten feet wide instead of six or eight inches as was the case with the steel turning plow. I am sure that Ole Ringness was a poor host to the new immigrants on the long drive back home, for his thoughts were on the original idea he had. He could hardly wait to get back to his shop, fire up his forge, and hammer out this revolutionary idea. At any rate, that is what he did, and here is the dished wheel, the very disc that he made. We found it on his little farm and got permission from his son to place it in the museum at the University of Texas where I trust it will be appreciated. As you look at this rude disc, at the hammer marks, I would like for you to remember that it represents the dream of a soldier in this Battle of the Plains.

For the inventor it was an empty dream. The story says that he decided to go to Washington to get a patent so that the lawsuits could begin. He went to Washington by way of New York, and while in New York he took sick and died. His invention was never patented. It may not have been the first disc plow, but it was original, and it does illustrate the drama and the tragedy of the battle I am describing.

My last illustration is a Nebraska story, and it happens to be well documented. The windmill was not invented in Nebraska, or for that matter in the United States. But we did have in Nebraska, as I have said, one of the most interesting developments of the windmill that I know of anywhere. The story begins with the good wet years that made the Plains so attractive in the 1880's. In these wet years the farmers made their great invasion of the semiarid country to the west of Lincoln. They took up homesteads along the Platte, on both sides, and in the other valleys. But the lean, dry years followed the fat, wet ones, and from 1886 far into the nineties, the settlers were driven back to the green country. Your novelists, poets, and historians have told the story of their retreat, and I shall not repeat it. But not all retreated. Some held their ground either because they were unable to move or because they had found a way



Above: Battle-ax windmill of Mr. Diedrich Huennecke, near Grand Island. (Photo from Barbour, *The Homemade Windmills of Nebraska*, p. 44.)

Below: Two-fan Battle-ax windmill designed by Mr. Elmer Jaspersen, near Ashland. (Photo from Barbour, *The Homemade Windmills of Nebraska*, p. 51.)



to live with the country. Our story concerns those who stayed, those who held on until the rains came again. It particularly concerns those who stayed because of the windmill to which they clung—life preserver in a sea of aridity.

These windmills of Nebraska were not those factory-made rosettes which you still see whirling so lightly on your western horizon. Few of those people had money enough to buy a windmill. Just as the people had to learn to make fences without rails, so they had to learn to make windmills without steel and without money. And there sprang up from Lincoln to the western edge of Nebraska and on into Colorado on both sides of the Platte Valley the greatest aggregation of homemade windmills known in all history. The Platte was a ribbon of sand, and the only supply of water was far below the surface.

You had here in Lincoln a Professor Erwin Hinckley Barbour who held the office of state geologist. He became interested in homemade windmills. He said:

Nebraska seems to be the heart and the center of the windmill movement. The famous Platte Valley, with its broad expanse and shallow wells, is a veritable windmill arena. From Omaha west through the State, a distance of 500 miles, and even beyond to Denver, there is a constant succession of these creations of a sturdy population.¹

In the summer of 1897 Professor Barbour employed three University students, equipped them with teams, saddle horses, camp wagons, cameras, and camp equipment. He sent them from Lincoln to Denver south of the Platte and had them return north of the river. They went to study homemade windmills. They photographed them and made records of their makers and owners. Said Professor Barbour: "They found these unique and interesting windmills everywhere. Going over the same ground in person the following year, eight to ten mills were commonly found clustered about a town, each widely separated town having

¹Erwin Hinckley Barbour, *Wells and Windmills in Nebraska*, Water Supply and Irrigation Papers, No. 29, U. S. Geological Survey, Washington, 1899.

a dominant... type They are also found in the Republican Valley and the valleys of the Loup rivers and their tributaries."

Professor Barbour found that the windmills fell into about seven main classifications and that they varied within each class. There were twenty varieties listed in all.

The main classes were Jumbo or Paddle Wheel or Go-devil, Merry-go-round, Battle Ax, Holland, and Turbines. Time does not permit me to describe them, and Dr. Olson did not rise to my challenge to find a single survivor of these homemade mills to exhibit here. I doubt that a single one does exist.

What recommended these mills was their low cost. Of the Jumbo Professor Barbour wrote: "The Jumbos are not wholly ornamental, but that is unimportant. The Jumbo has served useful purposes in hundreds of frontier homes . . . The average cost of such mills is \$4." J. L. Brown, nurseryman near Kearney, had one he used for irrigation of garden, strawberry patch, and fruit trees that cost \$1.50. Professor Barbour said: "The four-blade battle ax . . . is the favorite type around Grand Island and farther west. Such a mill, with pumping capacity for 100 to 125 head of cattle, may cost \$2 or \$3, but should not cost \$10, and may be built by those who are inventive without any outlay. Poles and strong limbs (for the tower) answer the purpose as well as new lumber, old dry-goods boxes furnish materials suitable for fans, old wire, nails, and bolts are common on every farm . . . In most of them (battle-axes) journals, gearings, rods, springs, wheels, nuts, bolts, braces, and lumber of discarded machinery are used."

Of the service these homemade mills rendered, we have this from Professor Barbour:

1. The contrast between the Nebraska farm without a windmill and one with: "one with cattle crowding around the well, waiting for some thoughtless farm hand to pump them their scanty allowance of water, the other where the cattle are grazing and the tanks and troughs are full and running over."

2. It made the difference in time of drought between the family who was able to hold on and the one that had to give up. The irrigation of one acre from a homemade windmill often produced more than all the rest of the farm or ranch.

3. It provided something in the way of luxury: running water in the house, green lawns in a desert, shade trees around a school house set on a bleak hilltop. There was always hope as long as the windmill kept turning.

And so we end with the symbol with which we set out. Behind the struggle of these people, behind the search for a horseman's weapon, a plains fence, and a prairie plow, and the effort to provide water by use of the wind—behind all these it was the spirit of the people, the common people, that kept on a-turning. And like the windmill it seemed to operate best when facing the high winds of hardship and adversity.