

Early Flour Mills in Indiana

By GEORGE BRANSON, Brazil

[Mr. Branson has made a detailed study of Parke County flour mills which is being printed in the *Rockville Tribune* beginning with July 8. His account of the various mills which have been built in Parke County from the earliest days is to be a part of an historical and archaeological survey of the county, which it is hoped may be published in the not distant future. Mr. Branson's general account of flour mills, their operation and the part they played in early Indiana history, here printed, applies almost equally well to all parts of the state.]

The first white men who came to Indiana to establish homes found no mills for grinding grain, except such contrivances as were used by the Indians to grind corn and the kernels of nuts. They brought a supply of flour or meal with them, and when that was exhausted, returned to the nearest mill for another supply to relieve their wants until they could clear the dense forest from a small patch of ground, and plant and raise corn. Sometimes they could trade with the few remaining Indians for corn, but not for wheat—the Indians did not raise wheat. Corn was the principal grain for making meal for bread. Sometimes wild rice and the kernels of acorns were ground and mixed with meal. Corn was not used so much from choice as from necessity. The cultivation of wheat in the forest region was not entirely successful in the first decade of settlement. The forest leaves made the surface soil too light, and the tall trees around a small piece of ground made too much shade. Wheat planted among the roots and stumps of trees did not mature well; it was musty and made a poor quality of flour. It was better on prairie land, but Parke County had but little treeless land. Corn was as precious to the Indian as wheat is to the white man, but the Indian made no mill, unless we call a mortar and pestle a mill. Some

stone mortars and pestles that were used by Indians have been discovered. They also used wooden mortars made by burning a deep cup-shaped cavity in a log or stump with hot rocks. Some pioneers used such vessels for pounding corn into meal, and for making hominy. Many of them made meal with a grater, which was a piece of perforated tin nailed to a board. The ears of corn were held in hand and rubbed on the rough surface of the tin until the grains were ground down to the cob.

The pioneers of Indiana constructed several kinds of flour mills. Along the Ohio River were floating mills. They were boats built and equipped for grinding wheat and corn. They were movable, and could be anchored where their owners wished to operate them. The water wheel was rotated by the current of the stream. David Thomas, who traveled extensively in the state in 1816 to 1818 said most of the mills that he saw for grinding wheat and corn were hand mills and horse mills. The hand mill was an improvement over the mortar and quite different from it. It was made by placing two boulders, each having one plane surface, in a box or in a section of a hollow log. A lever, crank or some kind of appliance used by hand rotated the upper stone which ground the grain on the lower stone.

Colonel W. M. Cockrum says in his *Pioneer History of Indiana*:

Horse mills were made in many ways. The only one I ever saw was constructed in a very simple manner. The main shaft, which was an upright post, had a small wooden pulley around it about six feet from the ground. The post that was turned by the horse had a large wooden pulley or hoop about six feet from the ground. A band or belt of rawhide was put around both of the posts on the pulleys. The horse was hitched to an arm which was fastened into the post with the large pulley, and as he went around, the main shaft went very fast. The grinding was done by the burrs located on the floor of the mill just above the belt.

The horse worked below the floor. The two shafts were far enough apart for the horse to pass between them.

Many horse mills were built in Indiana from 1820 to 1830, and some of them were used as late as 1840. I never heard of one in Parke County, but there were several in Clay

County which Parke County pioneers may have patronized.

Water mills for grinding grain could not always be located where their owners wished them to be. Their location was determined by the natural conditions of the water courses on which they were built. The banks of the stream, the bottom and the volume of water were determining factors. The location of the mill often determined the location of the village or town with its various industries. Almost without exception a saw mill was attached to a grist mill, but seldom was a grist mill combined with a steam saw mill. When a flour mill and its dam and race were completed, it cost little to attach a saw mill. A shed was constructed, a sash saw and log carriage were installed, and an additional wheel placed in the race. The streams afforded means for transporting logs to the mills. The village had its general merchandise store, blacksmith shop, postoffice and physician. All farmers had to patronize the mill. Each one had to wait his turn for his grist to be ground. The grinding was a slow process, and often he had to wait a long time. Sometimes there were so many ahead of him that he had to return the next day to get his flour. While waiting for his grist, he exchanged his farm products for goods at the store, had his horses shod and his farm implements repaired.

The mill was built on one side of the creek that divided the territory of its patrons into two parts, and when the creek was flush or obstructed with ice, it was difficult and dangerous for patrons on the opposite side to go to the mill and village. This situation called for bridges. Most of the old bridges in Parke County are still used, and are apparently as good as when first built. But there was no prophet then to admonish the builders to make them wide enough for the use of the coming automobile.

There was no uniformity in the construction of mill dams in Parke County. A large log placed across a small stream made a sufficient dam in one locality, a line of brush weighted with stones in another place, or a wall of logs held in place with irregular shaped stones made a dam that answered its purpose. Mill sites were a part of the public domain, and the height of a dam could be determined by the local court. A

dam that held the water on valuable farm land or obstructed navigation of the stream could be condemned. The largest and most substantial dams in Parke County were built on Big Raccoon Creek, the largest stream within the county. Some of these were about seven feet high, and were constructed by placing parallel to each other on the bottom of the creek three sills of heavy sawed or hewed timber. These mud sills were about four feet apart. A row of posts was mortised into the front sill, also a row of shorter posts into the middle sill. Then as many pieces of timber as there were posts in either row extended from the top of the posts down to the third sill. Heavy planks in horizontal position were fastened to the slanting pieces with wooden pins or spike nails. Oak timber was the best, because it was most durable in the water, and its strength was superior for resisting the pressure of water and logs that went over the dam during freshets. When the farmers were clearing the trees off the low bottom lands, a good deal of timber was carried away by the overflow of the creeks. Often large logs and whole trees lodged on the dam, frequently breaking it. During twenty years of flat-boating in Parke County all the boats on the two Raccoon creeks went over from one to five mill dams. This was done when the creek was flush, to protect the dam, also the boat. Slender tree-trunks forty feet long were used as skids on which the boat slid down from the top of the dam. Similar conditions existed on Sugar Creek.

The mill was built on columns of timber or stone tall enough to keep it above the high water of the stream, and to provide space for the mill race, which was constructed under the mill, beginning at the near end of the dam. It was made by placing two rows of posts six or eight feet tall, and from three to six feet apart in the row. These dimensions varied to suit the conditions of different mills. The posts were firmly fastened together at the top and bottom with cross pieces. Thick planks were nailed to the inner surface of the posts. Generally there was a solid stone floor on which to build, but if the bottom was clay or sand, it was necessary to make a hard floor to prevent washing out the foundation of the mill. The first floor of the mill was close above the race. A partition

was constructed across the race to hold the water until it was needed. There was an open space in the partition which was closed by a movable wicket.

The entrance of the race was guarded by strips of lumber that prevented debris from floating into the race. The space between the guards and partition was the forebay or head race; beyond the partition was the tail race. The water that was held at bay by the dam was the mill pond or bay.

The turbine wheel was used almost exclusively in Parke County; no other kind was used in the race. Its shape was that of a large tub with an upright shaft in its center. The rim was supported by spokes proceeding from the shaft. On the outer surface of the wheel were buckets or triangular boxes as long as the rim was wide. When the wicket was raised by the staff to which it was attached, the water rushed against the buckets, and forced the wheel and its shaft to rotate, and the shaft extending upward through the floor of the mill operated the burrs and other machinery attached.

The overshot wheel was constructed about the same as the turbine, but it was placed in upright position, and the shaft was placed at one side of the wheel. A large cog-wheel attached to the main wheel worked in a small cog-wheel around the shaft. The wheel and shaft were stationed below the dam, and instead of a race, a flume conveyed the water from the dam to the buckets at the top of the wheel, causing it to rotate forward from the dam. The undershot wheel was similar to the overshot, except that the flume was low, and carried the water to the lower part of the wheel, causing it to turn backward.

All of the water mills in Parke County used millstones for grinding all kinds of grain. Some of these stones or burrs were made of granite boulders or nigger-heads such as we find scattered over many farms. The stone that so eloquently suggested the name of our county seat could be reduced to a small burr by a skilled hand and a chisel and mallet. It came in the glacial period, and settled ages before the Indian and white man came. Each of the home-made burrs was a single stone, but the large burrs, especially those in the steam mills, were made and shipped in sections, and built up where

they were to be used. Sometimes the sections were firmly bound together by a wide iron band on the rim of the stone. Especially was it necessary to band the upper stone to prevent it from breaking when in rapid motion.

France shipped many burrs to America, and it is probable that a few came to Parke County. It is equally probable that the French burr used in the first mill at Armiesburg was shipped to New Orleans, then up the Mississippi, Ohio and Wabash rivers to its final destination. The first steamboat that came to Terre Haute arrived in 1822. From that time onward steamboats went far up the Wabash, and may have brought other burrs to Parke County. The burrs generally used in the United States when the Northwest Territory was opened for settlement were made of a coarse granular sandstone found in Ulster County, New York, Lancaster County, Pennsylvania, and Montgomery County, West Virginia. It is quite likely that the burrs used in Fair Play mill came from one of these localities. Burr stone is tough and cellular, with a rough surface that does not become smooth by rubbing. The best burrs were imported from France. They contained a good deal of silex that made their surface ridges very hard and sharp. The lower stone was the real burr and was stationary, while the upper or capstone was not necessarily a burr. It rotated rapidly as it pressed the grain on the burr. When the burr became too smooth to grind properly it was sharpened by cutting the grooves deeper, thus making the ridges sharper. This was dressing the burr, and did not refer to the upper stone. However, both stones were generally called burrs.

The manufacture of flour by the roller process began in Parke County in 1880. In 1884 Jacob Rohm installed machinery for that purpose in his new mill at Mansfield. In 1880 or 1881 Bright and Davis likewise equipped their new mill at Waterman. All the mills in the county have abandoned their burrs. The grinding is done by solid steel rollers four to six inches in diameter, and sixteen to twenty-four inches long. On the surface of the rollers are numerous spiral grooves and ridges or burrs that grind the grain as it passes between them. In most mills there are four pairs or stands

of rollers for grinding wheat, each pair grinding a little finer than the one preceding it. For corn, there are from one to three stands. When the ridges on the rollers become dull by continued use, they are sent to a factory where they are sharpened.

The original custom of mill operators was to take a toll for grinding all kinds of grain. Prior to 1853, there was no uniform rate of toll throughout the state, but the amount generally taken was one fourth for steam mills and one sixth for water mills. A state law of 1853 fixed the toll for water mills at one eighth of all kinds of grain and feed. When a patron brought his grist to the mill, the miller weighed or measured it, and poured it into the hopper which was situated just above the burrs. He dipped out the toll with a wooden measure, and opened the hopper by a sliding gauge, thus letting the grain flow slowly into a hole through the center of the upper stone, from which it spread between the two stones. The constant flow of grain, and rotation of the upper stone forced the flour toward the rim of the lower stone, where a groove with a spout attached carried it to a chest below the burrs. To make the flour coarse or fine the space between the stones was increased or decreased by set-screws that held the upper stone in place.

The unbolted flour was conveyed to the bolter. In a few of the earliest mills it was carried in a half-bushel measure, and the bolter was operated by hand, the owner of the grist doing the bolting. Later, in all of the mills the flour was conveyed to the bolter by elevators, and the bolters were operated by connection with the machinery of the mill.

The bolter was a large hexagon composed of a reel covered with silk bolting cloth. It was twelve or more feet long and about four feet in diameter. It was mounted in a horizontal position except that one end was slightly elevated. As it rotated, the flour sifted through the cloth into a chest beneath it, and the bran moved toward the lower end and out into a bin. To make the flour finer and whiter it was run through another bolter having a cloth with smaller meshes. This separated the shorts from the flour. None of the early mills bolted meal. The corn was ground by corn burrs, the owner

of the grist took it to his home, where the meal was separated from the hulls by a hand sieve. At present, corn is ground by the roller process and bolted, making a fine grade of meal or corn flour.

The coming of the roller process of grinding was the passing of the toll system, which was succeeded by the present system of exchange and deposit. Sometimes a cash payment was made for grinding feed. By exchange, the miller weighed and graded the wheat and gave the owner in return an amount of flour determined by the quality of the grain. The deposit system was and still is convenient for the farmer. He can take as much wheat to the mill as he wishes; the miller gives him credit for the equivalent in flour of which he can take up any part at any time that he may choose.

The exchange system has proved to be more satisfactory to the farmers than the toll system. Tolling was more complicated and often caused dissatisfaction. Sometimes the miller was accused of taking too much toll. Sometimes he failed to identify the patron's grain bags, and was criticised for returning inferior ones. To avoid this complaint, the law of 1853 required each patron to put his name on the bags he used, and provided that he could not recover their loss if he failed to do so. Another common complaint was made by the patron whose good wheat was ground immediately after a grist of musty, dusty and inferior wheat. The grain was ground just as it was brought to the mill—without fanning or screening it. The burrs were never entirely empty, and a small portion of bad flour was unavoidably mixed with the good. Sometimes the miller refused to grind a bad grist. If the owner contended that it should be ground, he could make trouble. A mill was and is yet a public utility, and refusal to grind for a patron subjects the miller to a fine and cost of court proceedings.