Vale and Downland Museum – Local History Series

Wheelwrights – Naves or Felloes

by Adrian Exton

In 1947 a wheel that was dated to the First Century BC was dug up in Anglesey. What was interesting was that the wheel was not flat, made from planks of wood, joined and braced. It was a dished wheel, the forerunner of practically every wooden wheel used in transport and agriculture up until recent times. The major advantage in having a wheel that is dished, in which the wheel is shaped like a saucer with the concave side away from the wagon, is that the wheel is more able to cope with sideways loads exerted when the wagon is running along the contour of a slope.

Before the First World War, nearly every village had its own wheelwright, a man skilled in his trade who would probably be assisted by his son or a boy serving a five-year apprenticeship. He would be able to judge the quality of timber in a standing tree, and able to assess from stored timber in the yard those pieces that would make a good shaft, spoke or felloe. During the Nineteenth Century, increased use of iron in the building of a wagon meant that the wheelwright became more dependent on the services of a blacksmith.

Ready-made parts for wheels became available from sawmills. This was an advantage to many wheelwrights as all timber had to be sawn and seasoned for around five years, thus much space was needed for storage. Not all pre-cut pieces were made from English wood; there are records of spokes made from Russian oak being imported. There was no guarantee, however, that the wood had been seasoned properly, so the wagons that were made by craftsmen who knew the wood are probably those that survive today,

The skill in building a wheel, which is an item held together without nail, bolt or glue, is considerable. The hub, or nave, was made from seasoned elm, usually wych elm that would not split, even with mortises cut for spokes in it. It was barrel-shaped to accept two iron stock hoops that were shrunk on hot. The hub was then set in a cradle, and the spoke mortises marked, drilled and cut. The mortises had to allow for a tapered fit and also for the angle of dishing of each spoke. The hub was augered with a 'boxing engine' to receive a cast-iron 'box' or 'metal' which is driven in and acts as a bearing for the axle. Finally, the top of the hub was cut away so that a cotter pin could be later inserted to retain the wheel onto an axle.

The spokes were made from oak, or sometimes ash, which had been seasoned for a minimum of four years. They had square 'feet' that fitted into the hub and circular 'tongues' that fitted into the felloes. Two spokes would fit into each felloe, which was made of ash or hickory. The felloes would have preferably been grown curved so that when the wood was sawn using a template, less grain of the wood was cut resulting in a stronger component. Felloes were joined together with an oak dowel.

The whole wheel was held together with a tyre made from iron. The tyre would start life as an iron bar, perhaps four inches wide and three-eighths of an inch thick for a working cartwheel. It would be shaped using a tyre-bending machine which is a set of rollers operated by a handle that bent the bar into a perfect

circle. After welding the two ends of the bar to form a ring, the tyre was heated in a circular fire to a dull red colour. Meanwhile, the wheel was mounted on a tyring platform - usually a large stone or metal plate - using a clamp to hold the hub of the wheel. When the tyre was ready it was swiftly carried from the fire with tongs, and placed over the rim of the wheel. After hammering into position, water was poured onto the hot metal to cool it before the wood of the wheel became burnt. As the metal contracted, it crushed the joints of the wheel tight. The dish of the wheel could be made more pronounced at this stage by loosening the tyring platform clamp and allowing the nave to rise up to it.

It was important that the circumference of the tyre was measured carefully. The length of bar required to make a tyre was a little shorter than the circumference of the wheel it was to fit. However, if the tyre was too tight there was a danger that excess pressure would distort the wheel. Generally, a tyre would be about one inch 'tight' or shorter than the wheel's circumference for a wagon wheel, and half-inch tight for a gig wheel.

In the 1920s, a decline in the volume of work for the business meant that wheelwrights diversified into other trades in which they could use their skills of carpentry - motor-body building; manufacture of gates, hurdles, tool handles; even coffin-making. Spare spokes would be employed as rungs in the making of ladders.

The costing of work became very difficult, and it is suspected that many a job was done for little or no profit. Inflation meant that to charge a fair price, careful costings had to be done for each piece. From the early 1900s it became the convention to give a cost estimate to a customer before doing a job. If the wheelwright used wood that had been seasoning for several years, accounting became guesswork!
In 1892 the Lloyd family moved to Wantage from Lyneham in Wiltshire to take over an existing wheelwrighting and blacksmith's premises. From here, Mr L J Lloyd and his two sons ran a busy coachbuilding business serving the needs of the local community.

During the First World War they produced a number of kitchen wagons for the army, using materials supplied especially for the purpose.

In the 1920s they, too, found the need to diversify, and there was a growing demand for repairs to motor-car bodies. A paint-spraying shop was equipped complete with electric compressor. An ex-army sewing machine was bought to stitch leather hoods for motor vehicles and perambulators. Wheelbarrows were made for sale in Kent's ironmongery shop in the town. Gradually, however, the wheelwrighting tools and skills were employed less and less.

Mr A Lloyd, one of the sons of L J Lloyd, has kindly donated the blacksmiths and wheelwrights shop, together with its contents to the Museum and there is now a permanent exhibition in the Museum.

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