

MANUFACTURE WATER-POWERED GRAIN MILLS

Two types of *corn* mill (for making oat and barley meal) were built in Scotland: a simple one, without gearing but with a **horizontal water wheel**; and a more complex type, with gearing and a **vertical water wheel**. The simple type was still being used in Shetland and Lewis in the early 20th century and was probably used in the Highlands too, in earlier times.

The shell of this one on East Burra, Shetland, has been re-used as a shed. The more complex type of mill, with its vertical waterwheel, needed a more powerful stream, but could be applied to driving other types of machinery. This type first appeared in the Lowlands by the 12th century, but eventually spread throughout Scotland. In a country with so much water and so many hills, windmills were never common.



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The small, horizontal mills belonged to families or groups of families, but the larger, vertical mills were the property of landowners. By demanding that all their tenants use the mill (*thirlage*) for a set fee (*multure*) they could guarantee an income from it. Anything from 1/24th to 1/11th of the meal produced could be held back as *multure*, with further quantities going to the miller (*bannock*) and his assistant (*knaveship*). Though much later in date, this little mill, on the island of Tiree, gives some idea of the simplicity of these early mills.

From around 1750, bigger, more efficient mills were built. New types of machinery came into use, *thirlage* fell into decline, and changes in farming, diet, trade and communications lessened the need for so many corn mills.



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Greater efficiency came from the use of cast iron in new types of gearing and more efficient designs for water wheels. This overshoot wheel (where the water is fed over the top) at Mill of Auchreddie, New Deer, Aberdeenshire has an iron hub, spokes and shrouds, with easily replaced wooden buckets.

Stone and lime replaced clay and turf for walling, turfed or thatched roofs gave way to slated or tiled ones. In earlier times, grain had been dried on farm kilns (except in the south-east). Now, rectangular kilns were added to the re-built mills, with perforated iron drying floors. One of these new mills could do the work of as many as six of the old type.

This large, early 19th century mill [187-410-R], at Smigel, Sutherland, has an integral kiln (left) and is substantially built in stone and slate. Some mills had machinery added to make flour or pot (i.e. pearl) barley, though others continued to mill only oat and barley meal.



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Thirlage gradually fell into disrepute during the 18th century. Without it, mills fetched a lower rent, but this could be replaced by fixed cash sums from those freed from its imposition.

Changes in farming, with some areas specialising in livestock and others growing fewer cereal crops, made for greater regional differences in the need for milling capacity. On the other hand, favoured areas such as Berwickshire, could mill cereals for both local and distant markets.

From the early 19th century, steam power began to be used in grain mills. These mills could be sited anywhere – preferably near their urban markets – and were not subject to stoppage through drought or flood. Away from the cities, however, some country mills managed to stay at work well into the

20th century. Of the few which now remain, some have gone over to milling animal feedstuffs, others to organic oat milling. A few more are preserved as historic sites, such as this one at Blair Atholl, Perthshire.



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To find out more:

Shaw, J.P. *Water Power in Scotland, 1550-1870*. Edinburgh, 1984

Shaw, J.P. 'An Introduction to the Technology of Meal Milling in Scotland' in *Scottish Industrial History*, Vol.5/1 (1982)

Gauldie, E. *The Scottish Country Miller 1700-1900*. Edinburgh, 1981

Looking at water mills

Mills were important because they ground grain – by far the most widely grown crop and an important part of people’s food. Some, on farms, threshed the grain (separated it from the straw) before it went to the mill or elsewhere. Water mills processed all sorts of other things too such as timber at sawmills, and paper in a paper mill. In the *waulk*, mill cloth was *fulled* or *waulked*, and in the period between 1780 and 1850 some very large water-driven mills were built for the textile industry.

The first thing is to **find out where mills were**. There are various lines of approach:

- **Place names** may show where a mill was, and sometimes also what kind of mill
- **Old maps** also show the location of mills
- **Estate papers in archives** may contain information about mills, since they were essential to the local economy. Often a farmer’s lease required him to take corn to a particular mill.
- **Looking** on the ground may reveal buildings placed close to a watercourse. You can then **look for other evidence**, such as a mill dam or lade.

Next, you can **think about how the mill actually worked**.

- Small mills served only a small area (in the extreme, one farm) and so only ran occasionally. If the water supply was only good at certain times of year, this might not matter.
- Large mills represented a huge capital investment and so needed to work all year. They needed a reliable water supply.
- Large mills also needed good transport to bring and take away large quantities of goods.
- A miller could live in the mill, but a huge textile mill needed housing for its workers

Finally, most water mills fell out of use in the middle of the 19th century, though some continue in action to the present day. You can look at the mills in an area and ask what the fate of each one was:

- **To have a second life**, powered by steam rather than water?
- **To be converted into a house**, or in the case of the largest textile mills, into flats?
- **To be demolished or left to decay?**