

## WINDMILLS and POPULATIONS COMPARED: a TENTATIVE STUDY

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I have long been intrigued by the multifarious reasons for the building of windmills. A specific choice of a good site or a prospective owner with sufficient capital to invest are both obvious examples of likely development. Improved technology or new agricultural advances provide further incentives for completely new work or replacement of older structures. But the essential need for each mill, in some presumably apparent ratio for a given population, must, I judged, somehow likewise be relevant to the study of our subject.

The opportunity came for me in a still-continuing survey of windmills in the old (pre-1974) West Riding of Yorkshire. This enormous county included in its easternmost part many villages and small towns on land that is almost level. South of York and north-east of Doncaster, it contains, and is bordered by, large slow-moving rivers, quite unsuitable for the establishment of water-mills. Only the watermill at Selby, on a tributary of the Ouse, and replaced by steam power in 1806, broke the otherwise total hold of windpower in this area. Even here, though, both watermill and steam mill had a windmill as an additional source of power.

Comparing the existence and number of mills with the parish populations in the first half of the 19th century, I found that there were approximate correlations that I think are worthy of notice.

In parishes where the population was under 200, no mill as usually to be found. Where one mill was established, it ranged from about 150 to about 550. In parishes with higher populations the ratio varied widely in individual cases, but it seems to have been approximately one mill to 500 people.

All this ignores the age and type of the mills and their relative efficiency, as well the number of pairs of stones they had. Ignored also are the unknown number of querns and horse mills in use. Even so, it seems to be a useful rough-and-ready guide.

No mill has been discovered in 38 parishes of this area. For the majority the population kept below 200 in each in the early part of the 19th century. Still without a mill, a few parishes crept up to 230, and one to 300 in this period, but the latter was adjacent to the Selby Canal, constructed in 1795. There were four parishes without a mill close to York, each in the region of 300-350 people, but they were near a river or roads for transport. The most significant place without a mill was at Wistow, which had 500 residents in 101 and 750 by 1841. This village is next to Selby and may have been serviced by the Selby mill.

There are 32 parishes (with an additional three linked with a neighbouring parish for milling purposes) where there was not more than one mill at any one time in the early 19th century. All but one of these had their mill shown as working on the six-inch map, published around 1850. While the range of population covered about 150 to about 550, some parishes approached 600. The scattered homesteads of Sykehouse, with about 650 people, had one mill. Cawood, close to Wistow and Selby, and like them on the River Ouse, had more than 1000 in 1801 and only one mill, so perhaps this is a still further extension of Selby's influence.

Some places had more mills, as in the following selection of examples. Swinefleet had one mill in 1801 with a population of more than 600. By 1851 it had risen to 1150, and another mill was built somewhere around that later date. Stainforth from 1750 had two mills, but while there were more than 450 residents in 1801, there were more than 900 in 1841. Fishlake, which had sometimes two, sometimes three mills in this period, kept in the region of 700 people. Hatfield had two mills and a population of more than 1300 in 1801, but this was increased by one soon after its population reached more than 2100 in 1831. In Thorne there seem to have been six mills in 1811 when the population was more than 2700; by 1823, when there were seven mills, the population reached nearly 3500.

The new town of Goole was built from 1826 as a port for the Aire and Calder Navigation. By 1831 there were four mills in the area covered by the population of 1700, though this was presumably mostly in the town serviced by two mills. The population continued to rise sharply, and though the town was begun in what was virtually the final period when windpower was used alone, by 1841 the population had reached more than 4000. Steam power must have become urgently needed, and was provided by 1839.

With regard to Selby, the population was not far from 3000 in 1801 and twenty years later exceeded 4000, but adequate water and steam power seems to have been sufficient throughout.

There is of course no precise correlation with all these figures, but certainly high populations brought more mills in the days when each settlement had a great deal of independency from its neighbours. Rapid enlargement of some villages necessitated additional mills within this period, and the coming of steam power rapidly broke up the ordered continuity that was otherwise to be seen. Improved transport meant also that independance of each village for its own milled products was gradually losing its hold.

Some anomalies remain to be resolved. This especially concerns those riverside parishes which seem to suggest that the river was used from an early date, and where Selby's watermill and steam mill seemed to serve an area beyond the town itself.

The study raises a number of interesting questions. Who actually used the mills in each parish? What happened when there was no mill? Does 200 represent the point of a population change beyond which it became worthwhile building a mill? How much of the cereal crop used to be taken for milling elsewhere, both to nearby towns as well as to adjacent villages? Was the population ratio dependant on the improved expectations of consumption of wheat by 1800 or so? Eighteenth century information, though sparser, seems by reason of the lower number of mills, to point in this direction.

Can comparisons usefully be made with other level areas of the countryside, or where watermills were not economically viable? I think, for instance of some eastern parts of Kent, the Isle of Ely, and the Isle of Axholme. Perhaps it will then become possible to determine in advance in certain areas where mills were to be found, and indeed the likely number of them eventually constructed there.

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## Discussion

McKEAN      Have you studied crops in these areas? If so, it may answer your questions.

PLUNKETT    It's all going to be arable, isn't it. It is almost the end of Fenland up there. I would expect early sheep-rearing region - in the monastic period - and later it gradually became more arable

TURNER       Yes; and yet I would think that even in the Sykehouse area there are two very large parishes with no village centre, just isolated farmsteads here and there. I would imagine that they retained the sheep and didn't have so much corn in that area.

JONES        Surely the real point is; where there are people, they must be fed. If they didn't grow their food, it still had to come from somewhere.

TURNER       And yet, where there is a population of 300, what happens? Where do they get their daily bread? Do they have a quern in their farm? Or do they travel to the next village, which might be some distance away? All these people - the 200 fit ones, anyway - go to the next village, to the mill.

JONES        There was the legal question of the soke, but this was in very much in decay in your period, even though there was a very late case of its enforcement and buying out in the district. A chart or table would bring out the relations you have discovered more clearly.

TURNER       Unfortunately the population is increasing and decreasing differently in these parishes all the time. I have really drawn out very isolated facts.

PLUNKETT    What source of information did you use for your population figures? Did you use the same source for the whole area?

TURNER       It was the census results for 1801, and every 10 years thereafter.

McKEAN       With a migrating population there might be various reasons why people moved, such as plague, or instance.

TURNER       I think populations increase and decrease in every village. I can observe it round here today.

McKEAN       Sometimes there are specific reasons.

PLUNKETT    The late 18th and early 19th centuries was a great flux period, for the southern part of England, anyway. In the mid-18th century there was an actual grain shortage; the price shot up, and there was great profit to be made out of milling. That is the reason that from about 1740 to the 1790's, a lot of mills were built; not just windmills, but anything that would produce flour, simply because it was wanted and there was good profit in it. But there was a shortage of grain.

- TURNER Some of these parishes are pretty isolated. They were almost self-supporting; almost as in the mediaeval period.
- PLUNKETT Yes, but they are not far from the Great North Road, nor from river navigation, and canals which were being built in the period.
- TURNER Yet mills were still being constructed or improved right up to the 1880's.
- PLUNKETT I think you could say that almost nationally. The fact that they are windmills rather than any other type is a local oddity.
- JONES Before the coming of steam, the windmill was the only type of mill you could up anywhere in England, wherever it was needed. As for being the pattern nationally, that is even more interesting if it is.
- PLUNKETT A windmill can be relatively inexpensive to construct on the basis that it is only going to be needed for a population of 300 - 700. It was probably the most economical form of power.
- JARVIS I am puzzled by this strange anomaly of the sizable community with no power source to grind their corn, but as I understand what has been said, there was both arable and animal farming at the time; what do we know of the diets of these people? Where the places without mills predominantly living off their animals? Do we know the proportion of cereal to animal foods people were eating? This is all vital if we are to tie in the relationship between the mills and the population. As for querns, they were a popular thing at one time, but when they were phased out in your area, I don't know. Does anyone know more?
- TURNER I can imagine - although I haven't collected any evidence - that within this period there was an improvement in the standard of living and that more and more people ate wheat flour.
- PLUNKETT Are there any old newspapers still published in the region?
- TURNER Of this period? Oh yes.
- PLUNKETT A lot of my data for the south is taken from old newspapers, and it is surprising what actually comes out. Births, deaths, marriages, bankruptcies, all sorts of things come into it. It is a very useful line of information to continue with. They give extra clues along the way, of where else to look.
- P BRYAN These villages without mills might be traced from them.
- A BRYAN Also, were there routes out of the villages, and into the towns? Laurence's map shows the waterways, some of them navigable. If it also showed the all-weather roads, that should also show up some interesting facts.
- PLUNKETT Particularly in that area; I would have thought that that part of the world would have particularly bad road conditions.

A BRYAN For cash, the country people would have taken produce to the town markets, which would have included the output of mills, but they would need transport to get it there in saleable quantities.

TURNER You still see people in Portugal making their way to towns to the market with their donkey.

PLUNKETT It happens today in Ireland.

P BRYAN In that area I imagine they did a lot of their trade by water.

PLUNKETT The canal system developed relatively early in that area.

A BRYAN But the road system didn't develop that long ago; not roads as we know them. We are talking about the 1700's onwards.

JONES To establish the reason for this population threshold for a mill, wouldn't it be useful to look at it from the miller's point of view? How much trade does he need to make a living? That much population produces that much trade. When it is too small, there is no opportunity. The trade of a successful mill can be thought of as diffusing out into adjacent areas. There is another thing you hinted at, but which didn't quite come out; the distinction between a parish with the population concentrated in one centre, and a parish with a similarly-sized population spread over a very large area. To a trader, they look very different.

PLUNKETT Have you considered whether there was any effect on the price of flour; if it varied according to the availability of a local mill.

TURNER No; I don't think the information is available.

PLUNKETT The trouble is, at that time the prices fluctuated violently. What was grown in the village was probably economic for the people to use, but if it was imported from outside, certainly in the 1750 to 1770 period, they would have to pay a lot of money for it. So locally-milled material was probably the cheapest way, anyhow.

JONES Except that high prices were a temptation to sell it away, of course.

JARVIS I am surprised at the output of these mills. If you reckon on an arbitrary figure of 1lb of meal per person per day; if a mill is serving about 300 people, that is only 3cwt a day on average. I know that with a windmill there are some days when you can't do very much, but it still indicates that some of these mills must have been small ones. What indication have you of size? Are they all single-stone mills?

TURNER Some post mills continued to work into the 20th century; they were very small post mills.

P BRYAN I know of one watermill near Doncaster which had four pairs of stones. It was quite a late mill.

- TURNER You draw the contrast there between a watermill such as I mentioned also, which can immediately serve a large number of people - 5000 and upwards - and a struggling little post mill with a part-time miller, that is only going to manage 500 or 600.
- A A BRYAN The output of any mill must be related to the power source available, no matter how many pairs of stones it has. In fact, an increasing number of pairs of stones can indicate a diversity of trade.
- JONES The part-time miller had a problem, particularly in a windmill. He might not work full time, but he still had to maintain his mill. Windmills are expensive things to maintain, and the part-timer earned less to pay for it. There is another threshold here; below a certain amount of trade, a mill is not worth maintaining.
- PLUNKETT What types of mills were they in this area? Were they predominantly of one size or type?
- TURNER Two-pair post mills, I should think. Many were like that; they only became three-pair as the 19th century wore on.
- P BRYAN How many post mills were there in that area? I never thought of post mills as a Yorkshire type.
- TURNER Many. I have the details here. I have been able to work out when there was evidence of a change; like Sykehouse, which changed in 1860-odd, and I think Fishlake also changed; there were post mills in Thorne, and so it goes on. At Moss there was a change, at Pollington a likely one, Hesk likely also. Then you are moving into the area where there was a time change as well. We are into the town mill era now, and we have to cut through that information to get to the stage further back. Also, back in the mediaeval period they were owned by the Crown at these places I have referred to - Fishlake, Hatfield, Thorne and so on - just one mill at each of these places, right back into the 1500's.
- A A BRYAN There is evidence of a vast number of old post mill sites all round the countryside - unlisted, unsurveyed, unexplored.
- TURNER There are also - within this area - some old tower mills. I don't think they are all that old; they are just slightly west, further up in the hills, where there were one or two old tower mills.
- A A BRYAN At one time a post mill was regarded as a portable structure.
- TURNER Perhaps someone who lives in the easternmost part of Kent might be able to check this subject, where there are very large flat areas without watermills. Or in the Isle of Ely, where there are also very large areas without watermills, might be used to make similar comparisons.

Ordnance Survey  
Grid squares:

10 km.

- corn-grinding windmill
- ↔ where one site replaced another in the same parish
- ⊙ Selby wind and water/steam mills

