

# Millstone making in England

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**Summary:** *Since the author's paper 'Millstones, Quarries and Millstone Makers' published in 1977 a good deal of interest has been taken in the subject, and much further information has come to light. The present paper is therefore an updating of the previous one as far as England is concerned, and tries to avoid any extensive repetition of information and ideas given there. It also avoids discussion of millstone making in the Peak District of Derbyshire since that very special area was dealt with in some detail in a recent paper in this journal. A general account is first given of the development of the millstone industry, particularly during the last two or three centuries, and its division into two distinct parts: (1) the making of monolithic millstones from indigenous rock in rural quarries and quarry workshops, and (2) the fabrication of millstones from imported small pieces of French burr-stone in urban factories. The import and export trades associated with these activities, and the cost of millstones, are discussed. Augmented data on English quarries which made monolithic millstones (outside the Peak District of Derbyshire) is presented, and it is found that none of these quarries are in the south of England. Finally, data on the many firms of urban millstone makers is given and discussed where that previously published can be significantly augmented, and it is mainly for the north of England that this is the case. (There was millstone making of both kinds in Scotland too, but this has been separately discussed. Further work on millstone making in Wales is in hand under the auspices of Mr Owen Ward and the Welsh Mills Group.)*

## 1 GENERAL DEVELOPMENT OF THE MILLSTONE-MAKING INDUSTRY

The breaking and grinding of grain is, of course, an ancient practice, and the use of rotatory stones for this purpose is also very old. Millstones are mentioned in the Bible,<sup>1</sup> and these would almost certainly be hand-operated rotary querns. Archaeologists have discovered numerous sources of querns, both of 'beehive' and flat-disc types, in Britain<sup>2</sup> and in other countries, and they were evidently made in large numbers. The technical distinction between a

quern and a millstone is not clear, and is clouded further by the difficulties, discussed in earlier papers, of distinguishing between a millstone and a grindstone; however, a useful although far from universal definition is that a millstone was intended to be driven in some power-operated machine, whereas a quern was hand-operated. Millstones in this sense were in use in Roman and medieval times, and have been found in Britain.<sup>3</sup> They must have been used in both vertical and horizontal water mills (ie mills with vertical and horizontal water wheels) and were of the flat disc type. Archaeologists have recently found pieces of about fifteen millstones used as hard-core on a site in Leicestershire dated to the twelfth century;<sup>4</sup> the complete millstones would have been about 90 cm diameter, with circular eyes, and notches 1 cm wide for the rynd, up to 25 cm or more thick, flat on both sides, with tapering but straight edges. This was presumably the sort of millstone used in the thousands of mills mentioned in the Domesday survey of 1086. In this instance the rock used for the millstones was millstone grit, probably from south of the Peak District. Interestingly, the same site had a number of flat querns, or circular stones, of about 45 cm diameter without eye-holes.

During subsequent centuries the uses of millstones diversified,<sup>5</sup> for the treatment of various kinds of vegetable and mineral material, both in face-grinding and by edge-runners (the latter have a long history outside Britain<sup>6</sup>), and as the power of mills increased the size of millstones increased also. For corn-grinding, diameters rose to 5 or 6 ft (almost to 2 m), but eventually settled down to the range 3 ft 6 in to 4 ft 6 in (1.08-1.35 m) in the nineteenth century.

The rock from which millstones were made had to be carefully chosen to meet exacting requirements, and sources of suitable rock were comparatively rare. Although large numbers of millstones were made from British rock, the requirements were so severe that there was from even the medieval period some importing of more satisfactory millstones (Cullin stones or

blue stones) made from a porous lava in the Eifel region of Germany, and exported through Andernach on the Rhine.<sup>7</sup> Later, from the seventeenth century onwards, large numbers of superior millstones were fabricated in urban factories from small pieces of special rock imported from France; these pieces were known as 'burrs' (sometimes spelt 'buhrs'), and the finished millstones were generally known as French burr-stones or French stones. The most important sources of British millstones were, in England, the millstone grit deposits of the Peak District of Derbyshire;<sup>8</sup> in Wales, the sandstone/quartz conglomerate of Monmouthshire<sup>9</sup> and of Anglesey;<sup>10</sup> and in Scotland, the grit of Kaim Hill in Ayrshire.<sup>11</sup> Apart from these important sources, there were many other places where suitable rock was found and used for making millstones which were adequate at least for local use, even if not widely used.

It is one of the purposes of the main part of this paper to list, and describe where possible, as many of these less important sources in England as have come to notice. Another purpose is to extend previous information on the manufacturers of the fabricated French stones.

Towards the end of the nineteenth century and in the early years of the twentieth, milling with steel rollers gradually displaced the stone-grinding of flour and the making of millstones for corn-mills almost died out. The modern revival of interest in stone-ground 'wholemeal' flour has led to a limited resurgence of interest in repairing and making millstones. The making of stone edge-runners for grinding wood-pulp and minerals continued well into the twentieth century, but is believed to have now died out. Around the turn of the century millstones made from 'composition', ie material made up from emery powder or ground-up French burr with a suitable binder such as magnesite cement, competed successfully with the solid-rock type for what work was still left for millstones.

### 1a Trade and costs

The author's researches have led to only very incomplete data on trade and costs in the millstone industry. However, the brief summary below gives some idea of the magnitudes and variations of these factors over a period of time.

#### Cost of millstones

Consistent and systematic data on the cost of

millstones over the eighteenth and nineteenth centuries is difficult to come by, and for earlier periods even more so. Occasionally a millwright's account books survive, other odd records are found, there are some Customs records, and there is Bryan Corcoran's series of advertisements in *The Miller* over the years 1878-95. It is not always possible to tell what kind or size of stone is concerned; in earlier centuries the imported Cullin or blue stones from Germany competed with Derbyshire Peak stones and local stones. In the eighteenth and nineteenth centuries, the competitors were fabricated French burr-stones and English and Welsh stones of different types.

For earlier centuries, Syson gives the following examples:

- 1299. Two millstones including transport from Sandwich to Milton, Essex, 11s 4d (£5.57); say 5s 8d each. As Sandwich was a port and is believed to have had no millstone quarries near, these were presumably imported stones.
- 1330. Five millstones from abroad, at port £3 3s 4d (£3.17), ie 12s 8d (63p) each. These must have been very small stones.<sup>12</sup>
- 1458. One millstone, including transport from Maldon to Lawling, Essex, 76s 8d (£3.83); this was definitely an imported stone.
- 1647. One new millstone for Elstead Mill, Surrey, £9 15s 0d (£9.75).

For the eighteenth century there are figures from the Customs records;<sup>13</sup> here, in 1746-7, 1766-7, and 1776-7, there is a fairly constant declared value of between £5 and £7 per stone, irrespective of size and whether imported or exported.

For the nineteenth century, there are several sources. The Customs records for exports<sup>14</sup> (probably Derbyshire Peak stones) for 1839 show an average declared value per stone of about £4; for 1847 about £9; and for 1867 about £4.5. Individual values vary from £2 to £12. Similar millstones from Colliers Law in Co. Durham were £8 to £11 per pair in 1858 according to Hunt.<sup>15</sup>

French burr stones were imported in the eighteenth and nineteenth centuries to be made up into millstones which, naturally, became more expensive than the monolithic millstones. It was not the cost of the burrs themselves which

made the millstones expensive; it was the skilled and careful labour that went into the fabrication process. The burrs were imported at about £2 5s 0d (£2.25) per hundred according to the Customs records already referred to, although Farries<sup>16</sup> quotes William Threadgold of Buttsbury Mill near Ingatestone, Essex, advertising burrs at £20 to £40 per hundred in 1806.

Comparative costs of Peak and French-burr millstones in the later nineteenth century are shown from the accounts of R. Summers, millwright, of Tanworth-in-Arden, Warwickshire.<sup>17</sup> A pair of French burrs (ie complete millstones) was consistently about £30 'faced and furrowed' (ie £15 each) whereas a pair of Peak stones was £9 to £15 (ie £4.50-£7.50 each).

Advertisements by the major millstone manufacturer, Bryan Corcoran of London, in *The Miller* over the years 1878-95 showed, consistently, French-burr millstone prices ranging from £15 for the cheapest stone of 3 ft 6 in diameter (1.1 m) to £40 for the best stone of 4 ft 6 in diameter (1.35 m), while his price for 'Best Peak' stones of 4 ft 0 in diameter (1.22 m) was £5 6s 0d (£5.3) per stone including the iron hoops.

Anomalous prices could be found. Job<sup>18</sup> quotes the supply of stones to Stone Windmill in 1803 as £16 5s 3½d (£16.27) for one pair of French-burr millstones and £16 16s 2d (£16.81) for each of two pairs of Peak stones. Thus, in this curious instance, the Peak stones are actually slightly more expensive than the French stones. Perhaps the latter were secondhand.

### Overseas trade

The Customs books in the Public Record Office give a record of imports and exports of millstones in certain years in the eighteenth and nineteenth centuries. Why it should be that millstones, querns, and burrs for millstones are separately listed in only a few years out of this long period is not known; these items do not appear at all in most years, whereas more commonplace items are specifically listed every year. Summaries of available entries are given in Tables 1-4.

Table 1 summarises the data on imports to England for the two years 1746-7 and 1776-7.<sup>19</sup> The 'quern stones' imported from Holland are thought to have been small millstones of the blue lava from the Eifel region of Germany, and the 146 tons (approximately) of these imported in

1746-7 must have represented something like 5,000 individual millstones, although the price per ton seems absurdly low. The 'mill stones' imported from Holland would be of the same material. Some of this type of millstone are still to be found in the possession of old mills in Britain.<sup>20</sup> The rapid growth of the import of French burrs over the years is evident even in the eighteenth century; figures for the nineteenth century are not known, but would have been enormously greater.

Table 2 summarises the numbers of millstones exported from England to overseas countries in 1839, 1847 and 1867.<sup>21</sup> While there can be little doubt that over the period the numbers were increasing substantially, the figures for 1847 sound a warning that the growth in the trade was not steady. Table 3 shows the actual destinations of the millstones for 1867, and it will be seen how widely the millstones were dispersed around the world. It is of particular note that British millstones were exported to European countries nearer the source of cullin stones and French burrs, including France itself. The USA was still importing considerable numbers of British stones, although indigenous sources were being exploited. Some of the exports from Britain were undoubtedly fabricated French-burr millstones made of burrs imported to England from France but made into millstones in English factories.

Finally in this section, because of the confusion (previously referred to) between millstones and grindstones, Table 4 has been prepared to show the exports of grindstones in 1857,<sup>22</sup> a year in which there was no entry for millstones. The very large numbers involved make it clear that these stones *were* different from millstones, and their relatively lower value per item is further evidence. However, it is not impossible that the millstone exports were included in these numbers.

### 1b Monolithic millstones from indigenous rock

With very, very few exceptions (which are discussed in a paper by Ward<sup>23</sup>), all millstones made from indigenous rock in England and Wales were monolithic, ie made in one piece. This imposed severe restrictions on the rock used. Not only did it require to be hard, with the right texture to provide a cutting and grinding surface that would not become polished very quickly, but it had to provide pieces of sufficient

**TABLE 1**  
**IMPORTS OF QUERNS, MILLSTONES & BURRS, 18th CENTURY**

<i>Item</i>	<i>Approx cost per ton</i>	1746-47	1776-77	
		(All from Holland except 2 millstones)	<i>From Holland</i>	<i>From France</i>
Large Quern Stones	10 shillings	8 1/2 Lasts*	1 2/3 Lasts	—
Small Quern Stones	6 shillings	65 1/2 Lasts	30 2/3 Lasts	—
	<i>Approx cost each</i>			
Mill Stones	£6	6 in no	47 in no**	2 in no
Burrs for Millstones	6 pence	2915 in no***	—	14,507 in no

\*1 Last is believed to have been about 2 tons. \*\*Specifically stated 'not French'. \*\*\*Probably actually came from France.

**RE-EXPORTS, 1776-77 only**

Small Quern Stones	9 Lasts	to Florida
Mill Stones	6 in no	to Nova Scotia

**TABLE 2**  
**EXPORTS OF MILLSTONES FROM ENGLAND TO OVERSEAS COUNTRIES,**  
**SUMMARY FOR 1839, 1847 & 1867**

<i>DESTINATION</i>	<i>NUMBER</i>			<i>DECLARED VALUE (£)</i>		
	1839	1847	1867	1839	1847	1867
Europe	200	144	1532	526	1225	6811
North America	178	8	367	622	97	1363
Australia & NZ	29	72	57	246	804	707
Other places	10	4	59	170	70	422
Totals	417	228	2015	1564	2196	9303

**TABLE 3**  
**EXPORT OF MILLSTONES FROM ENGLAND**  
**TO OVERSEAS COUNTRIES IN 1867**

<i>Destination</i>	<i>No.</i>	<i>Declared Value</i>
Russia (Baltic)	271	£ 1326
Russia (Black Sea)	102	910
Sweden	18	81
Norway	84	305
Denmark	225	704
Prussia	309	772
Hamburg & Bremen	153	757
Holland	184	728
Belgium	46	173
France	120	883
Other European	20	172
United States	347	1287
Canada	20	76
Central America	34	152
Australia & NZ	57	707
India	21	193
Other places	4	77
<b>TOTAL</b>	<b>2015</b>	<b>9303</b>

There were also 68 exported from Scotland, value £347.

**TABLE 4**  
**EXPORT OF GRINDSTONES TO**  
**OVERSEAS COUNTRIES, 1857**

(Entered in the books as 'Grindlestones Large')

Total number exported from UK was 19,258, of which 18,882 were from England.

Total value: £14,069

Destinations: Europe	3758
America	4882
Australia & NZ	8000
Africa	1486
Asia	665

size to provide a millstone entirely free of flaws or lines of weakness which might lead to breaking or even shattering under motion and stress. Suitable rock was almost always decided to be some form of millstone grit which would have a coarse texture with small quartz pebbles perhaps up to 1 cm across; or alternatively a sandstone/quartz conglomerate which was basically similar but with larger pebbles which in many places gave the rock the local name of 'pudding stone'. Generally in the nineteenth century but it is believed not universally, iron

bands were shrunk around the edges of the millstone to prevent shattering. Occasionally limestone and granite were used. For example, limestone was usual in gunpowder mills, for, if pure, it was much less likely to cause a spark than a siliceous rock.

The technique of cutting and shaping a millstone has been discussed in a previous paper<sup>24</sup> and will not be repeated here. Suffice it to say that the work was, in Britain, done at the quarries or on the open hillsides where the rock was found. As far as is known, the rock was rarely transported into factories for shaping. This meant that the work was done under the roughest conditions and often in extremely wild and exposed places. Some idea of the harshness of a millstone maker's life, although based on a French situation and not one in Britain, may be obtained from the graphic account of life at the quarries at Epernon by Beauvois.<sup>25</sup>

Transport of millstones from the quarries to the places where they would be used, or loaded on to boats or barges for transport to more distant places, was a very variable practice and is now generally not well understood. There is little doubt that in some areas the millstones were merely rolled down the slopes to a river below, probably with a horizontal pole through the eye-hole to enable some steering and control to be obtained. Deep gully paths leading from the quarries at Penallt, for instance, are strong evidence of this, as no doubt is the number of damaged millstones lying at the bottom of the slopes.<sup>26</sup> Generally, however, it is likely that the rate of damage caused by this method would have been unacceptable,<sup>27</sup> and there is positive evidence of special four-wheeled 'carts' being used in some areas. Those used in Anglesey appear to have been frames on wheels, and the millstone was carried vertically on a horizontal pole.<sup>28</sup> At Duxon Hill Quarry, Lancs (see later), a picture (reproduced here as Plate 6) dating from the first half of the nineteenth century shows the millstone lying flat on the cart, and this was the practice also in Germany.<sup>29</sup> The same picture shows a more distant cart carrying several millstones in the vertical position. It is likely that in some situations sledges were used.

The commercial or business organisation of millstone quarrying is little known, and outside the Derbyshire Peak, it is probably fair to say it is practically unknown. However, many of the

urban millstone-making firms which are discussed below advertised also the supply of Peak or Welsh or Kaim Hill millstones, thus making it clear that there was some sort of formal commercial organisation for such products. One presumably small firm, F. Stonier of Scholar Green near Stoke-on-Trent, advertised in *The Miller*<sup>30</sup> that he had available

'Grey Millstones for Grinding, Shelling, Hulling or Crushing Indian Corn, Barley, Beans, Paint, Cement, Plaster, etc. Made at the Old Millstone Quarries at Mow Cop, Cheshire.'

The wording suggests that he had just the single source of supply, although he did not have exclusive rights with regard to the products from Mow Cop, for William Jamieson, whose address was Mow Cop, was also a millstone maker at the same period.<sup>31</sup>

**TABLE 5**  
**MILLSTONES EXPORTED FROM NEWPORT & BRISTOL TO IRELAND & WEST WALES, 1550-1603**

<i>Number</i>	<i>Journey</i>	<i>Date</i>	<i>Notes</i>
6 pairs	Bristol-Milford	5/4/1566	
1 single	Bristol-Carmarthen	4/9/1566	also 24 grindstones
10 pairs	Bristol-Milford	12/9/1566	See Note 1
1 single	Bristol-Laugharn	5/1/1567	
12 doz pairs	Bristol-Milford	12/8/1567	see Notes 2 & 3
6 singles	Bristol-Laugharn	10/8/1587	
3 pairs	Newport-Dublin	11/8/1602	
1 pair	Bristol-Milford	20/6/1603	

Note 1. Merchant given as Thomas Cokssman of Bigswere, co Glos.

Note 2. As a pair of millstones weighed a ton or more, this load would have sunk its 30-ton vessel on which it was only a part cargo. The alternative possibilities seem to be either that the 'doz.' is a mistake and there were only 12 pairs, or that small grindstones were the cargo and not the millstones written into the port book.

Note 3. Merchant given as Thomas Kechine of Brigesweare, co Glos. This is possibly the same man as in Note 1.

There must have been some considerable commercial organisation even at a much earlier date, for the Welsh Port Books of the latter half of the sixteenth century<sup>32</sup> show numerous millstones transported by sea from Newport or Bristol to West Wales and Ireland — see Table 5 for details. As there were, it is believed, no millstone quarries likely to use Newport or Bristol as transshipping port other than those of Penallt (Gwent or Monmouthshire) and the Forest of Dean (Glos), it can be assumed that the stones

from these quarries were used far afield, and that merchants had some way of obtaining and dealing with orders. It is believed that this kind of trade continued into the nineteenth century. For example, 'millstones from the Forest of Dean' (which might have meant Penallt) were on sale at Carmarthen Quay in 1847.<sup>33</sup>

We have mentioned the need for the rock of which the millstone is made to be free from flaws or lines of weakness which might lead to breaking of the millstone in use. Unfortunately no information seems to be available on how the rock was tested, nor, indeed, as to how the quality of the finished millstone was assessed or as to the nature and effects of breakages. However, in the allied business of grindstone making, a good deal of information is available as there was a Home Office investigation of the matter in the 1890s.<sup>34</sup> Many fatal accidents were caused by grindstones breaking while in use, and probably most of these were attributable to flaws in the stone which could have been (and probably were) detected by the quarryman at the time of making, but were in fact ignored because of the system of piecework payment adopted at the quarries. It was also suggested that the users of the grindstones were given occasional presents by the 'quarry people' in order that they would not complain of the quality of the stones.

No doubt the same system applied in millstone making and supply, and probably faulty stones were sometimes supplied. But millstones were more expensive, size for size, and made of harder rock, and millers and millwrights were probably harder-headed than grindstone users. The large numbers of abandoned, unfinished as well as finished, millstones at and near the quarries are evidence that at least some quality-control was exercised.

### **1c Urban manufacture of French-burr millstones**

Much has been written about French-burr millstones<sup>35</sup> and many such millstones have been repaired or reconstructed and brought into use in recent years. Therefore it is not considered necessary to give much of a general account of them here. They came into use as the demands for finer flour (as distinct from meal) increased in the eighteenth century,<sup>36</sup> and their manufacture in England from burrs imported from France (already discussed in relation to

Table 1) reached its peak in the second third of the nineteenth century. By 1900 it was reported that only some seven manufactories remained,<sup>37</sup> with only about seventy men employed. What the numbers had been in the peak years is hard to estimate with anything approaching accuracy. From the tables of manufacturers previously published<sup>38</sup> together with the augmented tables to be presented later in the present paper, it can be estimated that there were perhaps about thirty-four manufactories in the middle of the nineteenth century which, with an average of say fifteen men each, would give a total of about 500 workmen; in the 1860s the number of manufactories was down to about twenty-four, but with amalgamations and rationalisation this would not necessarily indicate fewer workmen.

In the 1977 paper the author estimated that the peak annual production of French-burr millstones in Britain was probably about 3000-4000 pairs. By far the greatest proportion of these were made in England, and it is a fair starting assumption that about 7000 individual French-burr millstones were fabricated in England each year. From Table 1 we saw the annual imports of burrs increasing from nearly 3000 in 1746-7 to 14,500 in 1776-7, and while it is dangerous to extrapolate from two points on a graph, it does not seem unreasonable to state that the imports must have increased at least fivefold by 1860, and probably tenfold, suggesting a figure of 75,000-150,000 burrs per annum in that year. This would be sufficient for about 5-10,000 millstones, according well with the previous estimate of 7000.

Now the process of making a French-burr millstone was a long and slow, not to say dangerous one.<sup>39</sup> Both the published descriptions and the known retail cost of millstones support the guess that a man would have been unlikely to make more than a dozen a year, probably only eight. So the total number of workmen, allowing for labourers, would probably have exceeded 1000, double the number 'guestimated' above.

Assuming an average retail cost ex works of £30 per millstone, and 7000 a year, the addition of transport and dressing costs would suggest the French-burr millstone industry in England amounted at its peak to between £250,000 and £350,000 per annum — quite a large industry by the standards of the time.

It is believed that the picture given above of

the burrs being imported from France and fabricated into millstones in England is a true representation of the use of French-burrs in English mills. There were, however, exceptional cases of complete French-burr millstones being imported into England after fabrication in France by one of the French millstone-making companies. The only such case that has come to the author's notice is that at Stone Cross Windmill near Pevensey in Sussex,<sup>40</sup> where the makers' plate shows the makers to have been Bailly et Cie of La Ferté-sous-Jouarre. This was probably one of the smaller firms of the period in the middle part of the nineteenth century before the great amalgamations which took place in France and were necessary for the survival of the industry in the face of competition from roller mills.

Another exception to the general picture is the monolithic French millstone at Heckington Windmill, Lincolnshire. Such stones were more common in France.

## 2 MILLSTONE QUARRIES IN ENGLAND

In an earlier section some general considerations of the business of making millstones from the rural quarries have been discussed, and we turn now to the matter of where these quarries were in England. (Scotland and Wales have been treated in separate

**TABLE 6**

### PLACE-NAMES INCLUDING THE WORD 'MILLSTONE' IN THE WEST RIDING OF YORKSHIRE AND IN WESTMORLAND

<i>Name</i>	<i>Parish</i>	<i>Grid ref</i>	<i>Grid ref of village feature</i>
<b>West Riding</b>			
Millstone Hill	Bradleys	SE0048	
	Both		
Millstone Gill	Linton	SD9962	
Millstone Gill	Threshfield	SD9863	SD980627
Millstone Hagg	Thornton in Lonsdale	SD6873	
<b>Westmorland</b>			
Millstone Hags	Winton	NY7810	
Millstone Rigg	Winton	NY7810	
Millstone Sike	Dufton	NY6925	
Millstone Howe	Stainmore	NY8413	NY858122
Millstone Band	Stainmore	NY8413	NY848173

Source of names and parishes: A.H. Smith, (1) 'The Place-Names of the West Riding of Yorkshire', Cambridge, 1961, Part 6; (2) 'The Place-Names of Westmorland', Cambridge, 1967, Part 2.

papers.<sup>41</sup>)

There is no doubt that millstone quarries have, over the centuries, been very numerous and very widely dispersed. Millstones for local needs have been made from locally-available rock, but this was often not really suitable, and specialised supplies developed. Nevertheless, millstone quarries (and within the meaning of this term we must include those areas where suitable blocks of rock could be found already detached and not needing to be quarried) remained numerous and widespread. In the Peak District of Derbyshire, which has been separately dealt with in an earlier paper,<sup>42</sup> over 50 quarries and quarry areas have been identified as sources of millstones. In the rest of England, which is specifically the concern of the present paper, only some two dozen are listed and discussed in Table 7 and the gazetteer which

**TABLE 7**

### LIST OF KNOWN MILLSTONE QUARRIES IN ENGLAND EXCLUDING THE PEAK DISTRICT OF DERBYSHIRE

(Arranged in order from south to north according to grid references)

1. Draycott, Somerset	ST 48 51
2. Little Coxwell, Oxfordshire	SU 29 93
3. Redbrook & Forest of Dean, Glos	SO 5 1
4. Winslow, Bucks	SP 72 25
5. Upper Arley, Worcs	SO 757819, 767822
6. Alveley, Shrops	SO 757847
7. Castle Hill, Mountsorrel, Leics	SK 57 14
8. Mow Cop, Cheshire	SJ 858574
9. Sandyway, Cheshire	SJ 60 70
10. Millstone Rocks, Cheshire/Derbys	SK 050997
11. Black Coppice, Lancs	SD 622188
12. Millstone Edge, Lancs	SD 640213
13. Whittle-le-Woods, Lancs	SD 59 23
14. Duxon Hill, Lancs	SD 612258
15. Quernmore/Clougha Pike, Lancs	SD 55 60 and around
16. Over Kellet, Lancs	SD 55 70
17. Penhill, Yorks	SE 036857
18. Underbarrow, Westmorland	SD 484924
19. Barnhill, Cumb	NX 999219
20. Carr Crag, Durham	NY 918316
21. Lazonby, Cumb	NY 533352
22. Collier Law, Durham	NZ 005420
23. Gateshead Area, Durham	NZ 278566, 277583, 283586, 265605
24. Kenton, Northumberland	NZ 222678

follows, but there is no doubt at all that there have been many more which remain to be identified.

Places where querns were made in ancient times<sup>43</sup> can often be identified now by their names. 'Places where quernstones were quarried in OE times are indicated by such names as Quarndon (Derbys), Quorndon (Leics), Quarrington (Durham), Quarlton (Lancs), and Whernside (Yorks)'.<sup>44</sup>

So also there are place-names containing the word 'Millstone', and these must surely indicate the former making of millstones. Two such, in Cheshire and Lancashire respectively, are included in the gazetteer which follows; some in the Derbyshire Peak District were noted in my previous paper; and four in the West Riding of Yorkshire and five in Westmorland are set out in Table 6. The VCH<sup>45</sup> mentions a 'Millstone Howe' in the North Riding of Yorkshire, and says more generally:<sup>46</sup>

Grindstone and millstone quarries are referred to in several manorial and forest records. For example, in the closing years of Edward II the accountant for the east ward of Pickering Forest returns a quarter of a mark from mill-stones and tomb stones sold. In Arkengarthdale in 1436 we hear of a quarry (quarella) for millstones farmed at 4s a year, while at 'Gyllesetcrage' in Bowes Manor a 'new quarry of grynstones' opened up sixteen years before, was still productive.

And we find later references of a general kind, such as that quoted in gazetteer entry no 16 where Rumblesmoor (better known as Rom-baldsmoor) in Yorkshire — a vast upland area to the south of the Wharfe valley — was in the early eighteenth century apparently known as a producer of excellent millstones. This is supported by the name 'Millstone Lumps' on Addingham High Moor (part of Rumblesmoor) at SE 071472 marked on the modern 1:10,000 map.<sup>47</sup> There was certainly plenty of millstone grit here and elsewhere in the West Riding, which Raistrick<sup>48</sup> describes as providing building stone of massive size for industrial purposes. Why not also millstones?

The gazetteer lists millstone quarries and areas of very different sizes, history, and importance; some are associated with strong physical evidence and some with documentary and commercial evidence. In some cases it is not entirely clear whether it was not perhaps grindstones rather than millstones which were the principal product. But in all cases the word millstone has been found used in connection with them.

An interesting feature of the preceding discussion and of the gazetteer is that all the places where millstones are mentioned as a local product lie to the west of a line joining the mouth of the River Tees to Aylesbury (in Buckinghamshire) and to the north of a line joining Aylesbury to Taunton (in Somerset). It is thought that this boundary does also broadly delimit the area in which millstone grit and tough conglomerates occur. However, as has been already said, in early times millstones had to be made where really suitable rock was not to be found, and Reynolds<sup>49</sup> illustrates a pair of Romano-British millstones found at Richborough in Kent, the larger of which dated from the first century and was made of Kentish Rag, which would be normally considered too brittle for millstones. The papers on querns referred to earlier indicate that querns were made at many places south and east of the boundary defined above. And granite millstones found in Cornwall indicate that this relatively unsuitable rock, which, however, is in plentiful supply there, has been extensively used where more suitable rock is not available.

## GAZETTEER

### 1. Draycott, Somerset

Quarries in the dolomitic conglomerate at around ST 48 51, and some of their products, have been described by Wallis.<sup>50</sup> However, in this paper there is no mention of millstones, and the evidence of the production of millstones from the Draycott conglomerate is based on actual specimens of bark-mill runner stones in the neighbourhood of Cheddar. For example, there is a stone with serrated edges, formerly used at a tannery, now at Fairland, Cheddar, ST 460530 (see Plate 1). (I am grateful to both Dr Wallis and his friend Dr G. Parker for the identification.) It is not known whether this rock was used for corn-mill stones, and certainly the millstone-making side of the business must have been quite small.

### 2. Little Coxwell, Oxfordshire

Mr J.K. Major has informed me of an area in this parish known as Coles Pits, now overgrown, but formerly comprising some 273 bell pits containing broken and incomplete millstones of prehistoric, medieval and possibly later date. He concluded that these were early millstone quarries. They covered an area of about 14 acres



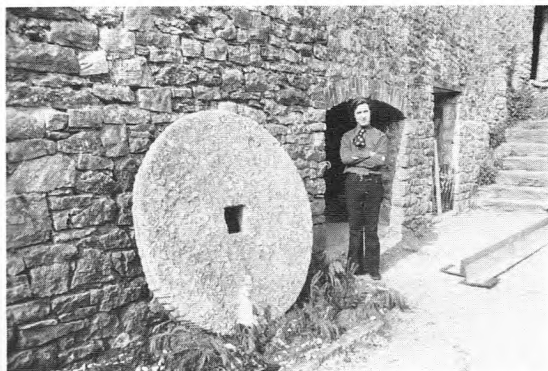


Plate 1 Serrate-edge millstone 5 ft 3 in diameter, 5 in thick made from Draycott conglomerate, at an old tannery at Cheddar, Somerset, with the owner, Dr Blakeney-Edwards, standing beside it.

in grid square SU 29 93. The curious thing is that a description of the pits dated 1785<sup>51</sup> states quite clearly that 'not a single stone is to be found in the bottom or sides of these pits, nor in the adjoining part of the field.' However, the great archaeologist O.G.S. Crawford stated, after field study,<sup>52</sup> that 'that was simply because detritus and weathering has covered up the stony stratum'. He found a nearly complete millstone, 'much larger in diameter than a rotary quern, and thinner, and...evidently intended for a power-driven mill'. It seems probable that an ancient source of querns was later used for millstones.

### 3. Redbrook and Forest of Dean, Gloucestershire

Upper and Lower Redbrook are contiguous small villages on the Gloucestershire side of the River Wye below Monmouth, immediately opposite the Welsh parish of Penallt in which millstone making from the sandstone/quartz conglomerate which outcrops there was a considerable industry in former centuries.<sup>53</sup> It is possible, therefore, that the frequent references to millstone makers at Redbrook concern people who perhaps lived at Redbrook but operated across the river in Penallt. For example, in 1812:-<sup>54</sup>

JOHN TAYLOR, LOWER REDBROOK, CIDER-MILL and MILL-STONE MAKER, BEGS leave to acquaint his Friends and the Public, that he has, at a very considerable expence, opened and enlarged his QUARRIES, which produce the finest and best Stones, (that is to say, of the Cockle or Flint Grit,) for making Cider-Mills, Mill-Stones for Grinding Corn, &c ever yet offered to the Public, and for their colour and duration is not to be equalled in the Kingdom...

He does not say where his quarries were located. For several decades after this, until 1875 or thereabouts, the Hudson family were millstone makers at Redbrook,<sup>55</sup> but it is reasonably certain that their principal quarry was across the river at approximately SO 535095. Yet there are persistent references not only to millstone making at Redbrook, but also in the Forest of Dean generally,<sup>56</sup> and one must accept that this was possible as superficially suitable rock does occur there. Nevertheless, I have not seen any reference to actual locations of the quarries concerned.

### 4. Winslow, Buckinghamshire

Dewar<sup>57</sup> states that millstones were made from here in medieval times from the conglomerate rock.

### 5. Upper Arley, Worcestershire

There are two quarries in the sandstone here, both long disused. That at SO 767822 is relatively small; that at SO 757819 larger and better placed for transport, being near the bank of the River Severn. Grindstones for the scythe and tool industry of Belbroughton<sup>58</sup> were undoubtedly made at Upper Arley, presumably in these quarries, and there is reference to millstones too; eg the VCH says:<sup>59</sup>

Upper Arley...the soil varies, the subsoil being sandstone rock...there is a freestone quarry on the estate of Mr Woodward from which grindstones, millstones, and building stone are obtained.

Gateley,<sup>60</sup> writing in 1949, said that

The owner of the farm [probably Extons Farm] on which two of the quarries were situated at Arley, states that some of the stones were taken down the Severn to Bewdley, where the very marked terraces of the river are more easily negotiated than higher upstream: narrow-gauge rails can still be seen running from the quarries down to the river. The majority of the stones, however, were brought to Belbroughton by horse and cart direct from the quarries.

It is believed that these quarries, like those a little further north in Alveley (see below), also supplied the steel-tool and implement industries further afield, although proof of this has not yet been found. The references to millstones might imply some local use for corn-milling, but, if not merely due to a confusion of terminology, more probably signify a use as edge runners for cider mills or the grinding of minerals such as clay.

### 6. Alveley, Shropshire

Although in a different county, the large sandstone quarry here is only about two miles from those at Upper Arley discussed above. It was

probably more important as a source of grindstones and perhaps millstones. Disused for sixty years or so, it is now overgrown with vegetation and almost devoid of loose pieces of rock. It is about 100 m across with almost vertical sides about 10 m deep; it has been dug into the ground and not into a hillside. There is what appears to be a spoil tip near the entrance trackway, now overgrown with trees and undergrowth. Gateley<sup>61</sup> says that 'until about 1926, this small village [Alveley]...supplied the scythe industry with most of its grinding stones from nearby sandstone quarries...'. A longer account of the making of 'millstones' (by which grindstones are really meant) at Alveley is given from personal recollection by Holder.<sup>62</sup> The rock was split into large cubes of about 3 m sides, and then into slabs about 30-35 cm thick, the former process by gangs of men with drills and the latter by toothless steel stone saws, using sand and water as the abrasive agent. Each slab was then supported on small pieces of stone so that it lay flat, and then, after a circle of the proper diameter had been scribed on it, the hole and edges were chiselled by the stonemasons.<sup>63</sup> Steam cranes were used to move the blocks and slabs about, and the finished grindstones were transported away from the quarry by special horse-drawn wagons.

The quantities of grindstones used in the Belbroughton tool industry were enormous, as is testified by the large numbers of discarded grindstones lying about or used as paving, etc in the area around Belbroughton. No doubt some of the grindstones found a destination in the needle mills of the Bromsgrove and Redditch areas. How many of the stones produced were used as millstones in any of the usual senses of the word is not known.

### 7. Castle Hill, Mountsorrel, Leicestershire

This area was probably a source of querns in ancient times; Christian says:<sup>64</sup>

Buddon Wood [SK 5615], overlooking the A6 below the eastern edge of the triangle [of Charnwood Forest], must be the 'hill of querns' (small mill-stones) that gave its name to Quorndon at its foot.

In the middle of the nineteenth century it was said of Castle Hill at Mountsorrel:<sup>65</sup>

These hills are composed chiefly of a remarkably hard and durable red and grey syenite or granite, much of which is used in the locality for millstones, paving, roadmaking and building. Since the establishment of the Mountsorrel Granite Works the quarries have been more extensively worked...

and the products were later more widely exported from the locality.

So this is a case of granite millstones; what sort of millstones is not made clear.

The old Mountsorrel Quarry is at SK 577148 and had grown quite large; there is now a newer one centred on SK 565150 shown as about 500 m across on the 1979 OS map.

### 8. Mow Cop, Cheshire

This sharp-peaked hill of millstone grit, standing high above the Cheshire plain and distinguished by the large stone folly on its peak, is reckoned to have been a source of querns in ancient times.<sup>66</sup> The making of millstones there probably started in medieval times, and certainly there was much cutting of millstones in the eighteenth and nineteenth centuries. John Farey,<sup>67</sup> in 1811, referred to 'Mole-copt south of Congleton in Cheshire' as a place where Peak millstones were formerly made; note the word 'formerly', suggesting that the activity had then temporarily ceased. There was a pair of Mow Cop stones at Trentham Windmill (c SJ 850397) in 1801.<sup>68</sup> Millstones built of segments of Mow Cop stone were used at Nether Alderly (Cheshire); Brindley's Mill, Leek; and Brund Mill, Sheen (Staffs).<sup>69</sup> Millstone making at Mow Cop was evidently at a good level of activity in the second half of the nineteenth century; we have in an earlier section of this article mentioned both F. Stonier of Scholar Green and Wm Jamieson of Mow Cop as makers of Mow Cop millstones.

The 1:10,000 Geological map of 1968 shows for the area around the folly (which is at SJ 858574, and called by the OS 'Summer House (NT)') the description 'Old Quarries in Massive Gritstone'; they lie more-or-less on the 'Mow Cop Fault'. Below the folly on the east there can still be seen a half-hewn millstone only partially cut out from the parent rock (see Plate 2), and on the south-west side of the folly there are several cavities where millstones have evidently been excavated (see Plate 3). The half-hewn millstone blank is about 4 ft 8 in diameter, so that allowing for trimming, the finished millstone was evidently intended to be between 4 ft 0 in and 4 ft 6 in diameter — well within the range of sizes of nineteenth-century millstones.

### 9. Sandyway, Cheshire

The only evidence I have for a millstone quarry in this area comes from the account of her journeys in 1698 by Celia Fiennes.<sup>70</sup> (Both



Plate 2 Partially-cut millstone still attached to main body of rock at Mow Cop, Cheshire. 4 ft 8 in diameter (white bar is 12 in long); centre-pop visible.

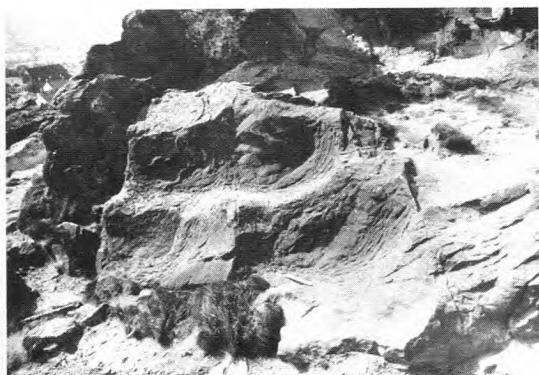


Plate 3 Cavities where millstones have been excavated at Mow Cop, Cheshire.

Mr J.H. Norris and Mr O.H. Ward have kindly drawn my attention to this reference.) When exploring the salt-making activities near Northwich (as it is now spelt), she mentions 'ye place whence they digg the mill stones'. As far as can be ascertained from her account, this place must be somewhere just to the south of Sandiway. The geology here is not encouraging, being sand and gravel. There is a large excavation marked at SJ 607698 on some OS maps, but whether this is relevant is not known.

#### 10. Millstone Rocks, Cheshire up to 1974, now Derbyshire

A line of crags or cliffs stretch for about 350 m from west to east, centred on SK 050997, and are marked with the name Millstone Rocks on the OS maps. As the rock is millstone grit, it is not unreasonable to suppose that millstones were at one time made here.

#### 11. Black Coppice, Lancashire

Millstone making may have taken place here



Plate 4 Partially-completed millstone at Black Coppice, Lancs, with hole cut. 4 ft 0 in diameter. (Steel rule has 12 in exposed.)



Plate 5 Another partially-completed millstone at Black Coppice, Lancs, without hole. 4 ft 0 in diameter. (Steel rule has 12 in exposed.)

over a stretch of escarpment between approximately SD 620185 and 622188. Price *et al*<sup>71</sup> stated that 'On the grit escarpment overlooking White Coppice several millstones cut from the gritstone are visible (622188)'. On a personal search, two such stones were found, evidently cut from daystones (ie blocks already lying free on the surface), one with a centre hole and one without, both about 4 ft (1.22 m) diameter (see Plates 4 and 5). Whether there was ever any great activity here in millstone making is not known.

#### 12. Millstone Edge, parish of Withnell, Lancashire

This name is marked on OS maps (eg 1:10,000 Sheet SD 62 SW) centred on grid reference SD 640213. It seems to infer millstone making at some point in the past.

#### 13. Whittle-le-Woods, Lancashire

There is a long tradition of millstone or grindstone making here. There are now large quarries

in the place, but 'millstones' have been found in them. In 1851, Edward Baines<sup>72</sup> said 'Whittle contains large millstone quarries...', and they have been referred to more recently: 'The Whittle Hill industry also supplied some of the finest millstones in the country.'<sup>73</sup> The Chorley Borough Council Community Programme obtained three millstones found in the Whittle quarries;<sup>74</sup> one appears to have been a corn-mill stone of 6 ft (1.82 m) diameter, this size indicating pre-1800 use; the other two, of 4 ft and 5 ft diameter respectively, have serrated edges and possible furrowing, thus leaving their use rather indeterminate. Another stone, of 4 ft 4 in diameter, was found in the canal nearby.

Geologically, the rock is the Revidge Grit. Price *et al* say:<sup>75</sup> 'The Revidge Grit has been worked at Hough Hill (592230) and Denham Hill (591228) about a mile NNE of Whittle-le-Woods, where it is a coarse current-bedded and occasionally pebbly gritstone. It has also been quarried extensively at Whittle-le-Woods.'

The Community Programme, already mentioned, has documentary evidence of a

millstone-maker at Whittle in 1630, so there seems little doubt of the former importance of the place for millstone making.

#### 14. Duxon Hill, Houghton, Lancashire

The millstone quarry near Houghton Tower is best known through the engraving of J. Kernot of the picture by G. Pickering entitled 'Houghton Tower' (sic), reproduced by Edward Baines in 1831 and 1836.<sup>76</sup> This picture, reproduced here as Plate 6, while showing the great house on its eminence, shows in the foreground an undoubted millstone quarry complete with sheer legs for lifting the stones, a four-wheeled cart for carrying them one at a time in the flat position, several men and horses, and a number of finished or nearly-finished millstones.

This picture can be correlated with a large-scale OS map, and one is left with no doubt that the quarry illustrated is Duxon Hill Quarry at SD 612258. Field investigation confirms this, although the quarry is now largely grassed over. Further confirmation comes from a partially cut stone found near the main quarry edge, shown in Plate 7. The scale of activity in the early

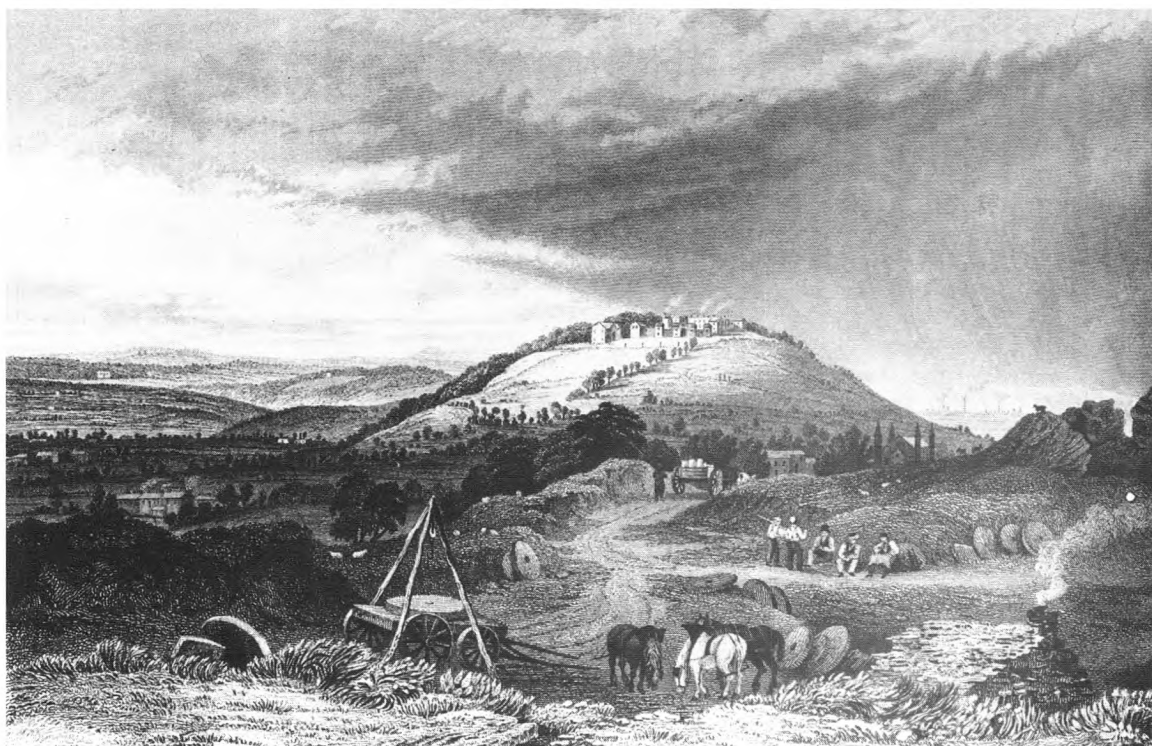


Plate 6 Photograph of engraving of 'Houghton Tower', included in Edward Baines's book of 1831. Duxon Hill millstone quarry in foreground. Reproduced by permission from copy of second edition (1836) held by Birmingham Central Library.



Plate 7 Part of partially-cut millstone at Duxon Hill quarry, Lancs.

nineteenth century must have been quite considerable, and it is no doubt significant that no other type of stone product is shown in the old picture. The quarry must not be confused, when searching for it, with the nearby flooded quarry adjacent to the lane at SD 608256; this appears to have a type of rock different from the millstone grit of Duxon Hill Quarry. The grit is referred to, at Duxon Hill, by Price *et al.*<sup>77</sup>

#### 15. Clougha Pike and Quernmore, Lancashire

This is a difficult case to tie down. The name Quernmore suggests that querns were once made here, and Baines<sup>78</sup> states that 'The stone here is full of those hard flinty particles which constitute what is called Hunger Stone, of which small mill-stones, similar to ancient Roman querns, were formerly made...' The VCH<sup>79</sup> records that millstones were sold here for six shillings in 1314 and for one shilling in 1346. A number of old millstones of different sizes could recently be seen outside Conder Mill (or Bibby's Mill) at SD510594, very near Lancaster but even nearer to Quernmore (see Plate 8). All were of a grit stone, had convex upper surfaces, and the two largest (5 ft 7 in and 4 ft 6 in diameter respectively) had certainly been corn-mill stones as they had the notches for 4-pronged rynds. Local opinion was that they had been made on Clougha Pike, the nearby 1500 ft (450 m) hill, which for our purposes can be regarded as stretching from SD 51 to 56 eastings and 59 to 61 northings. However, no one we spoke to recalled seeing anything resembling a millstone on Clougha Pike or its slopes, not even a sheep-farmer whose farm was on the northern slope. Our own search was negative, but, of course, days would be needed to cover such a large area, not the few hours we had available.



Plate 8 Grit millstones at Conder Mill, Lancs. The two larger ones are 5 ft 7 in and 4 ft 6 in diameter respectively. These stones are thought to have been made from local rock in the Quernmore area.

Undoubtedly there has been quarrying on Clougha Pike — the large scale maps show several old quarries — and it seems safe to assume that millstones have been made there.

#### 16. Over Kellet, Lancashire

There are numerous quarries in this area, mostly for limestone and some large ones still working. It is unlikely that physical evidence can now be found of former millstone making, but in the early eighteenth century John Lucas<sup>80</sup> said that a quarry here provided millstones

equal in goodness to those got upon Rumblesmoor in Yorkshire, or to those of Derbyshire, ...sold for eight, nine, or ten pounds the pair. This Quarry does not only supply the Country about it, and several Mills on the western Coasts of England, but a great many are thence exported to Ireland, the Isle of Man, &c.

The millstones would no doubt have been made from millstone grit, which occurs immediately to the east of the limestone.

#### 17. Penhill, near Leyburn, Yorkshire

Robert Hunt<sup>81</sup> stated in 1858 that millstones were made in a millstone-grit quarry here, but gave no details.

#### 18. Underbarrow, Westmorland (now Cumbria)

Davies-Shiel and Marshall<sup>82</sup> state that a quarry at SD 484924 provided limestone runners for gunpowder mills, and that a specimen of 5 ft (1.52 m) diameter was left in the quarry.

#### 19. Barngill, near Whitehaven, Cumberland (now Cumbria)

This was mis-spelt 'Bamgill' by Robert Hunt in 1858;<sup>83</sup> he said it was 'white freestone' producing 'grindstones and rice mill stones sent to all parts of the world'; 20,000 cu ft per year at

one shilling per cu ft or about 14s per ton. The quarry was worked by Samuel Farrer & Co and was on the land of the Earl of Lonsdale. The 1:25,000 OS map of 1952 shows the name Barnhill against a quarry of width about 150 m at NX 999219, and this quarry is mentioned and illustrated by Eastwood *et al*,<sup>84</sup> with the statement that one of the lower exposures was White and Yellow Sandstone, but with no mention of the products made therefrom.

#### 20. Carr Crag, Teesdale, Co Durham

Atkinson<sup>85</sup> states that there is a quarry here at NY 918316 where millstones have been made, and where several unfinished ones are still to be seen.

#### 21. Lazonby, Cumberland (now Cumbria)

Little Salkeld Mill nearby had in 1981 (and probably still has) a pair of sandstone millstones which were believed to have come from a local quarry. On searching maps and then in the field, a quarry was found at NY 533352 which, although still being worked for stone blocks, had an abandoned millstone lying at its edge. This stone is shown in Plate 9, and was 3 ft 8 in (1.15 m) diameter with a 5 in square hole, and of thickness about 1 ft 6 in (0.45 m). It was evidently intended as an edge-runner, but did give some encouragement to the belief that this quarry had been a source of millstones for at least local use.



Plate 9 Sandstone millstone beside quarry at Lazonby, Cumbria 3 ft 8 in diameter, about 1 ft 6 in thick.

#### 22. Collier Law, near Stanhope, Co Durham

Hunt<sup>86</sup> states that millstones were made from the millstone grit here in 1858, when the main millstone-makers were Garfoot and Burrow and the price was £8 to £11 per pair of stones. The quarry was probably at Millstone Rigg, NZ 005420, and Atkinson<sup>87</sup> states that two 5 ft specimens can be seen there.

#### 23 & 24. Gateshead and Newcastle upon Tyne, now County of Tyne and Wear

There was a massive grindstone industry here, with millstone making mixed up with it, and this is discussed more fully in the next section of this paper. There was a long history and there were several important quarries. Of these, Atkinson<sup>88</sup> mentions only Springwell, where the rock is a massive sandstone. I believe the following quarries were all involved in the manufacture and trade:

#### 23. South of the Tyne

- (i) Eighton Banks, NZ 277583
- (ii) Springwell, NZ 283586
- (iii) Gateshead Fell or Sherriff Hill,<sup>89</sup> NZ 265605
- (iv) Windynook, NZ 277566; named as 'Windynook Quarries on the 1:25,000 OS map of 1947.

#### 24. North of the Tyne

- (v) Kenton, NZ 222678

According to Atkinson, grindstones were still being made at Springwell in the early 1970s. The industry was at its peak, of course, in the second half of the nineteenth century.

### 3 URBAN MILLSTONE MAKERS IN ENGLAND

The object in this section is to supplement the data regarding the manufacturers of French burr millstones which was given in my 1977 paper. That data was fairly comprehensive for London, Birmingham, Gloucester and Bristol, and for these towns it has not seemed worthwhile at this stage to undertake extensive further research, although what has been done suggests there is certainly scope there. But for other towns it has become evident that the earlier data was quite inadequate, and for Liverpool, Leeds, Hull, and Newcastle upon Tyne it has been possible to prepare quite extensive new lists, which are presented here, in Tables 8, 9, 10 and 12. Table 11 deals with seven other towns which had millstone makers: Huddersfield, Stockton-on-Tees, Thirsk, Manchester, Tarporley, Leicester and Worcester. It will be noted that neither here nor in the previously-published lists are there any millstone makers recorded for the south and south-east of England.

The situation at Newcastle upon Tyne was quite different from that at the other towns in that millstone making was there dominated by grindstone making; consequently it is discussed

**TABLE 8**  
**LIVERPOOL**

<i>Year</i>		<i>Source</i>
1766	No millstone makers, but 'Millstone Inn' in Castle St.	Gore's Directory
1774	No millstone makers, but 'Millstone & Castle Inn'	Gore's Directory
c 1799	Gard(i)ner (initials & address not known) ( 'the late Mr Gardiner of Liverpool' c 1820)	O. Ward, <i>Melin</i> , 1, (1985), 33-47
1814	Claimed date of establishment of founders of Kay & Hilton (see entry for 1873)	
1817	Claimed date of establishment of Davies & Sneade (see entry for 1890)	
1821	Hilton Robert, 53 Fleet St, manufactory, 7 Fleet St	French burr-stone manufacturer Gore's Directory
1823	Hilton Robert, Liverpool millstone manufacturer, will proved	Record Soc of Lancs & Cheshire
1824	Coleman John, 23 Crosbie St Jackson & Henderson, 3 Tabley St Kay & Hilton, 7 Fleet St Whitnell Rt, Regent St Wilson James, 22 Lydia Ann St Young Joseph, 13 Temple St (also Quay St, Manchester)	All millstone makers & French burr dealers E. Baines's 'Lancashire'
1828	Kay George, Liverpool millstone maker, will proved	Record Soc of Lancs & Cheshire
1828-9	Kay & Hilton, 7 Fleet St Murray & Brown, 22 Lydia Ann St Young Joseph Jun, 12 Temple St	All millstone manu- facturers & French burr importers Pigot's Directory
1834	Kay & Hilton, 56 Fleet St Murray & Brown, 22 Lydia Ann St Young Joseph Jun, 13 Temple St	All millstone manu- facturers & French burr importers Pigot's Directory
1844	Cotton & Davies, 22 Cheapside Kay & Hilton, 14 Fleet St Murray & Brown, 8 Lydia Ann St	All millstone manu- facturers & French burr importers Pigot's & Slater's Directories
1848, 1850	As 1844 except Murray & Brown absent	Pigot's & Slater's Directories
1858-9	Davies Edward & Son, 21 Cheapside Kay & Hilton, 18 Fleet St Winstanley & Kelly, Smithdown Lane	All millstone manu- facturers & French burr importers Slater's Directory
1873	Davies Edward & Son, 21 Cheapside Kay & Hilton 'manufacturers of French Burr millstones, shelling stones, grindstones, etc. (supply the British Government Mills) — established 1814, removed from 18 Fleet St, W to Bankhall bridge N.'	Millstone manufacturers (French Burr) Gore's Directory Gore's Directory
1875	Davies replaced by Davies & Sneade, 19-21 Dale St	) City of Liverpool
1878	Davies & Sneade, works Charters St, offices Cheapside	) Archivist
1881	Davies & Sneade entirely at 18-24 Charters St	)
1883	Kay & Hilton at 29 Brasenose Rd, Bankhall bridge N	
1890	Davies & Sneade ('estab 1817'), Charter St	Millstone makers Kelly's London Directory

1892	Davies & Sneade, 18-24 Charters St Kay & Hilton, 27 Brasenose Rd, Kirkdale	Millstone manu- facturers & French Burr importers	Slater's Directory
1895	Davies & Sneade, 18-30 Cheapside* Kay & Hilton, 29 Brasenose Rd, Kirkdale**	Millstone manu- facturers & French Burr importers	Kelly's Directory

\*said to have taken this range of premises in 1886 and remained there until about 1933

\*\*this firm appears to have disappeared by 1912

City of Liverpool  
Archivist

**TABLE 9**  
**LEEDS**

<i>Year</i>		<i>Source</i>
1834	Marris (sic) George, also at Hull. Leeds address in 1835, 69 New George St; in 1838-9, Moxon's Yard, Kirkgate	Directory
1841	'Wm Westwood & Sons, Leeds, 1841'	Examples at Holgate windmill, York (French Burrs)
1848	Westwood William & Sons, Fishers Yard, Meadow Lane. Millwrights & dealers in French mill stones	Slater's Directory
	Marris (sic) George, Millwright & French mill-stone manufacturer	Slater's Directory
	George Maris, Cross Mill St, also at Hull	Display advert
	'Millwright & French Mill Stone Manufacturer, Importer & Dealer in French Burrs, Derbyshire Peak Grey and Blue Stones	Slater's Directory
1850	Westwood Joseph, Fishers Yard. Millwright	White's Directory
	Child J.&T., 13 Maris St. Millstone makers	White's Directory
	Savery James, 5 Wade Lane. Millstone makers	
1853	Child W.J.&T., 13 Maris St. Millstone makers	White's Directory
	Savery James, 5 Wade Lane. (Not after 1853). Millstone makers	
1856	Child W.J. & Thos, Cross Mill St. French & Belgian millstone manufacturers	Directory
1857-67	Child...(as 1856) and at Hull.	
1870	Child...(as 1857) and at Hathersage, nr Sheffield	White's Directory
	Ellison Joseph, importer, Old Victoria Foundry	appear under
	Westwood Wm, Ingram St, Holbeck	'Millstone makers'
1872	W.J.&T. Child, 'Manufacturers of French, Belgian & Derbyshire Millstones. Edge stones for seed crushing, millstones for rice cleaning, and paint & colour grinding, always on hand.' Proprs of Derbyshire Peak Millstone Quarries, Burbage, nr Sheffield. Nelson St, South End, Hull; & Cross Mill St, Leeds Childs continued much the same until 1892 with Leeds address changing to 22 Commercial St in 1890, 'works Hull'. There is then an absence from directories for many years.	Porter's Directory
1910	Child W.J.&T., Whitkirk, Leeds; Burbage, Yawncliff & Old Edge Quarries, Derbyshire; 'Peak millstones for grinding barley, beans, maize, colours; for shelling & pearling barley, rice, &; edgestones for crushing linseed, rape, &; french burr millstones All communications to Whitkirk, Leeds.'	Kelly's Directory
1920	Childs' entry in Kelly's Directory much the same.	



**TABLE 10**  
**HULL**

<i>Year</i>		<i>Source</i>
1823	Boyd George & Wm, Witham Cass Wm, Witham Norman & Smithson, Sykes St Parkin Wm, Stewart's Yd, 152 High St Silverwood Thos, 22 New George St	All millstone makers Baine's directory
1828-9	Boyd George & William, Witham Kennedy William, near Six Sail Mill, Holderness Rd Norman & Smithson, Sykes St Silverwood John, New George St	All millstone makers & French Burr dealers Pigot's Directory
1830	'N & S Makers Hull, 1830'	example at Worsbrough Mill, Barnsley

**GEORGE MARIS**

Apparently started business between 1831 and 1834.

1834	Marris (sic) George, New George St, also at Leeds	
1840	Maris (sic) George, changed to 57 Wincolmlee, also at Leeds	
1848	Maris George, changed to New George St in advert but still 57 Wilcolmlee in classified entry; also at Leeds. Millwright & French mill stone manufacturer	Various Directories
1837	'Geo Maris, Maker, Hull, 1837'	Example at Edrington Castle Mill, Berwick- shire, NT939534

**STAPLETON**

Apparently started business between 1840 and 1842

1842-8	Stapleton James, 78 New George St.	millstone maker
1851	Stapleton James & Co at North Side, Old Dock (later entered as Dock Office Row)	Various Directories
1852	'J. Stapleton & Co, Hull, 1852	example at Seedy Mill, Staffs SK102133
1857	Stapleton Thomas & Co, Dock Office Row. The firm had moved to London by 1869.	Directory

**CHILD**

Apparently started business between 1842 and 1846

1846	Child William, 5 Trippett.	French millstone manufacturer
1851	Child John, Nelson St, also at Leeds	
1851-82	Child William, John & Thomas, Nelson St	
1882- 1889	Child ...(as 1851-82) at English St.	Millstone manufacturers Various Directories
1892- 1900	Child...(as 1882) at St James St	Millstone manufacturers

**OTHER MILLSTONE MANUFACTURERS**

1848	Campbell Duncan (the Executors of), Foundry Row, Sculcoates. Millstone makers and French Burr dealers.	Slater's Directory
1900	Smith Robert George, 46 Liddell St.	Millstone manufacturers Kelly's
1901-5	Smith R.G. 46 Liddell St & St James St.	Millstone manufacturers Directory

**TABLE 11**  
**MISCELLANEOUS MIDLAND AND NORTHERN TOWNS**

<i>Year</i>	<i>Town</i>	<i>Source</i>
<b>HUDDERSFIELD, Yorkshire</b>		
1853	De la Barré, A.B. (French), 9 St Paul's St.	Millstone makers White's Directory
<b>STOCKTON-ON-TEES, Co Durham</b>		
1847	'Jas Savery Maker Stockton on Tees 1847' on eye-ring at Timothy Hackworth Museum, Shildon	
1847	Savory (sic) James, 9 Castlegate	Millstone maker Slater's Directory
1848	Savery James, Castle Gate (N.B. James Saver also at Leeds 1850-53.)	Millstone maker Slater's Directory
<b>THIRSK, Yorkshire</b>		
1846	'Knowles of Thirsk 1846' on eye-ring on example from South Kilvington Mill, Thirsk.	Thirsk Museum
1848	Knowles Wm, St James	Millwright Slater's Directory
1850	'W. Knowles, Maker' Thirsk, 1850'	example at Crakehall Mill, N. Yorks SE243902
1851	William Knowls (sic), 18 Gt St James Green.	Millwright Census
<b>MANCHESTER</b>		
1824	Young Joseph, Quay St (also 13 Temple St, Liverpool)	Baines's 'Lancashire'
<b>TARPORLEY, Cheshire</b>		
1873	Richard Hughes, Bunbury Heath. In liquidation.	Millstone Manufacturer <i>Solicitor's J &amp; Reporter</i> , 1873-4, p152
<b>LEICESTER</b>		
1850	Bird, William, Millwright & millstone maker, Humberstone Gate	Slater's Directory
1877	Henry Ball, Millwright & millstone maker, 10 Erskine St (not in directories 1863 or 1881)	White's Directory (Advert)
<b>WORCESTER</b>		
1828-9	Street & Marston, Millwrights & millstone makers, Bath Rd	Pigot's Directory
1850	Jackson, John, Millwright & millstone maker, The Butts	Slater's Directory
1850	Marston, William, Millstone maker, Bath Rd	Slater's Directory
1850	Ward, William, Millwright & millstone maker, Hylton St Clements	Slater's Directory

separately below. However, one thing needs to be clearly stated: although the urban millstone makers generally described themselves as makers of French burr millstones, they nearly always dealt also in monolithic English (eg Peak) and Welsh millstones, and stated this in their advertisements.

**Liverpool, Leeds, Hull and other towns except Newcastle upon Tyne**

Tables 8-11 give chronologically-arranged data for these towns, and should be self-explanatory. The sources of the data are also given, and it will be seen that these are mainly directory entries. The observation and recording of surviving millstones, which is now being

taken more seriously by industrial archaeologists and mill enthusiasts, shows that of the various firms listed, the most important appear to be the two long-lasting Liverpool firms, Davies & Sneade and Kay & Hilton. Their French burr millstones, which, as far as is known, always carried makers' name-plates, can still be found in large numbers over the Midlands, the North of England, and Scotland.

The firms often changed their addresses, and when the address is given on a maker's name-plate, it can therefore help to date the stone. These addresses may well have been office addresses, and the works probably moved much less frequently. There are some puzzles over addresses; one that has not been resolved is that of J. Young of Liverpool and Manchester. In Table 8 his only Liverpool address is Temple Street, (although the number changes), but on the nameplate of a French burr bedstone made by him, now at Y Felin, St Dogmael's, Dyfed, his address is given as Cheapside, Dale Street, Liverpool. (I am indebted to Mr Owen Ward for this information.) This suggests that he may have continued in business for some time after my last entry, which is 1834.

### Millstone making in Newcastle upon Tyne

The story of millstone making in the Newcastle upon Tyne area is very difficult to unravel because of the dominance of the grindstone-making industry. Newcastle grindstones were famous from quite an early period — certainly the industry was well-established in the early sixteenth century.<sup>90</sup> Prices of grindstones at Newcastle (Gateshead) in 1568 for 20d for a 28 in stone, 8d for a 21 in stone, and 6d for 14 in stone, weighing perhaps, 2, 1 and ½ cwt respectively. There are difficulties in understanding the records, for dimensions are quoted in 'grindstone feet' which Rickerby says measure 7 in, and weights in 'chaldrons', which Rickerby says are about 15 cwt, but which the OED indicates to be between 2 and 3 tons. In 1568 a chaldron of grindstones cost 13s 4d; this seems to support the 15 cwt basis of the chaldron. By 1799 the price loaded on to a ship at Newcastle was about 18 shillings per chaldron for large stones (35 in and upwards) and 16 shillings for small stones, indicating little change over two centuries. In 1857 the Customs books<sup>91</sup> show 19,258 'grindstones large' exported from Britain, valued at £14,069 (see

Table 4), and assuming these average about 56 in diameter and weigh about 15 cwt each, then the price per chaldron (of 15 cwt) has still barely changed over nearly three centuries.

The rock used for Newcastle grindstones was a mainly-yellow sandstone which would hardly have been suitable for corn-grinding millstones. Yet in the latter half of the nineteenth century, several of the grindstone makers of the area showed themselves also as 'millstone manufacturers'. Table 12 shows a summary of data extracted from the Trades Directories of Newcastle, Gateshead and District (mostly Ward's Directory) over the period 1827-1959, and it will be seen that very few of the millstone makers were not primarily grindstone makers. This suggests that the 'millstones' concerned may well have been pulping stones (ie edge-runners), although I am informed<sup>92</sup> that 'until late in the nineteenth century sandstones from quarries in the Newcastle area which were coarse and moderately soft were very much favoured for oat shelling and many were even exported to Canada and northern states of the USA.' The longest-established firm of grindstone-makers — Richard Kell and Co, established in 1784 and enduring nearly 150 years — showed themselves as millstone-manufacturers in an entry in a Glasgow directory in 1875-84 although not in the Newcastle directory. On the other hand, F.B Sheppard in 1880 mentioned French burrs but not grindstones and A. Potter and Son in 1890 were millstone makers but not grindstone makers. Yet the present author has never heard of named millstones attributable to these firms. On the other hand, examples are known (eg at Tocketts Mill, Guisborough<sup>93</sup> and Crakehall Mill,<sup>94</sup> both North Yorks) of fabricated French-burr millstones by W. Mountain & Son, who appear as grindstone makers in 1875 and as wire-workers from 1801 to 1898, but never as millstone-makers.

### Acknowledgements

There are so many individuals and the staff of so many institutions who have given me assistance in this study that the best I can do is just to list them with gratitude: D.T.N. Booth, Halesowen; R.V. Clarke, Oldbury; G. Douglas, Glasgow; K.G. Farries, Surrey; W. Foreman, Oxford; J.K. Harrison, Cleveland; M. Hoather, London; S.R. Hughes, Aberystwyth; J.K.

**TABLE 12**  
**NEWCASTLE UPON TYNE**

<i>Year</i>	<i>No of firms</i>	<i>Millstone makers Names and addresses</i>	<i>Grindstone makers Number of firms and special notes</i>
1827	0		5 inc Richard Kell & Co, 6 Broad Chare
1838	0		5 inc Richard Kell & Co, 51 Quayside
1850	0		2 inc Richard Kell & Co, 33 Quay
1855	1	R. Atkinson, at Felling & Skinnersburn; office 16½ Quay	6 inc Richard Kell & Co, 53 Quay (Atkinson also grindstone mfr)
1860	1	R. Atkinson...(as 1855)	4 inc R. Kell & Co and Atkinson, also R. Robson at Kenton
1865	1	R. Atkinson...(as 1855)	6 inc Kells, Atkinson, Robson and also R. Forster, Exchange Buildings. Robson now has an office in Newcastle
1870	0		5 inc Kells, Robson, Forster but not Atkinson
1875	2	R. Patterson & Son, 133 Percy St & 49 Grey St R. Kell & Co, 6 Sandhill, Newcastle (in Glasgow Directory as grindstone <i>and</i> <i>millstone</i> manufacturers, but not in Newcastle Directory as such.)	6 (as 1865) inc Atkinson, also W. Mountain & Son, Picton Terrace*
1880	3	R. Atkinson & Co, Guildhall R. Patterson & Son... (as 1875) F.B. Sheppard, 53 Park Rd, works Broad Chare (ie Quayside). Sheppard's display advert mentions French burrs for first time in Newcastle	8 inc Kells, Robson, Forster, Atkinson, but not Mountain
1885	4	Atkinson...(as 1880) Patterson...(as 1875) R. Forster, 51 Quayside R. Robson, 21 Grainger St W	7 inc Kells and the 4 millstone makers
1890	5	Atkinson...(as 1880) and Robson...(as 1885) Patterson (but now 'Johnson & Dent, proprs) Taylor & Co, Customs House chbrs A. Potter & Son, 2 St Nicholas Buildings & Willington Quay	7 inc Kells and the millstone makers except Potter
1895	4	Atkinson...(as 1880), Taylor... and Potter... (as 1890), Potter's office at Melbourne St J. Elliot, Hamburg chbrs	8 inc Kells and millstone makers except Potter, also Patterson and Robson (+1 if Robt Robson different from Robson & Co)
1900	4	Atkinson etc (as 1895)	7 Kells etc (as 1895)
1905	4	Atkinson etc (as 1895)	7 Kells etc (as 1895) (Robson & Co now gone)
1913- 1914	2	Newcastle-on-Tyne Grindstone Co, 42 Pilgrim St Taylor & Co...(as 1890)	8 inc Kells (now proprs of Atkinson), Patterson and Elliot
1923	0		5 inc Kells, Patterson, Taylor
1929	0		5 inc Kells and Patterson
1937	0		3 inc Patterson (Kells gone)
1947	0		2 inc Patterson
1959	0		0

\*Although Mountains never appeared as millstone makers, French-burr millstones made by them are known (see text).

Major, Reading; J.H. Norris, Wilmslow; C.R. Salisbury, Nottingham; J.A. Sass, Humberside; V.I. Tomlinson, Salford; O.H. Ward, Bath; M. Watts, Devon.

Public Record Office, Chancery Lane and Kew; British Library, Colindale; Birmingham Reference Library; University of Birmingham Library and Map Library; Liverpool Record Office; Central Library, Hull; Central Library, Leeds; North Yorkshire County Library, Thirsk; Reference Library, Stockton-on-Tees; Reference Library, Newcastle upon Tyne.

## Notes and References

- The earliest reference is in 2 Samuel 11, v21, which is thought to date from about 600 BC. The translation in the New English Bible actually uses the term 'upper millstone'.
- Eg S. Caulfield, 'The beehive quern in Ireland', *J Roy Soc Antiquaries Ireland*, 107 (1977), 104-38 (includes review of querns in Britain); R.H. Hayes *et al*, 'The distribution and lithology of beehive querns in Northeast Yorkshire', *J Archaeological Science*, 7 (1980), 297-334.
- Eg a millstone, 19 in (0.5 m) diameter, is set in the churchyard wall at Deerhurst, Glos (NGR SO 870299), and is medieval if not earlier. (This was first drawn to my attention by Mr S.R. Hughes.)
- Personal communication from Dr C.R. Salisbury.
- Some idea of the varied uses may be gathered from J.A. Sass, *The Versatile Millstone: Workhorse of Many Industries*, Society for the Preservation of Old Mills, Knoxville, Tennessee, USA (1984).
- See, eg M. Dumas (ed), *A History of Technology and Invention*, Vol 1 (1969), 102.
- J.K. Major, 'The manufacture of millstones in the Eifel Region of Germany', *Industrial Archaeology Review*, 6 (1982), 194-204.
- D.G. Tucker, 'Millstone making in the Peak District of Derbyshire: the quarries and the technology', *Ind Archaeol Rev*, 8 (1985), 42-58.
- D.G. Tucker, 'Millstone making at Penallt, Monmouthshire', *Industrial Archaeology*, 8 (1971), 229-39 plus 8 plates.
- G. Tucker, 'Millstone making in Anglesey', *Wind and Water Mills*, 1 (1980), 16-23.
- D.G. Tucker, 'Millstone making in Scotland', *Proc Soc Antiquaries of Scotland*, 114 (1984), 539-556.
- L. Syson, *British Water-Mills*, (1965), 113-7. (A document discovered by Mr W.A. Seaby at the Warwickshire Museum, since the proofs of this article were corrected, indicates that the item dated 1330 is erroneous and should be ignored for the present.)
- PRO, CUST 3/47, 3/67 and 3/77.
- PRO, CUST 9/26, 9/34 and 9/74.
- R. Hunt, *Mineral Statistics*, (1858).
- K.G. Farries, *Essex Windmills, Millers and Millwrights*, Vol 1 (1981), 54.
- Kindly supplied by Mr D.T.N. Booth.
- B. Job, *Staffordshire Windmills*, Midland Wind & Water Mills Group, Birmingham (1985), 37-8.
- Based on PRO, CUST 3/47 and 77.
- Eg at Mosedale Low Mill, Cumberland, NY 366327, and Maulds Meaburn Mill, Westmorland, NY 625167.
- Based on PRO CUST 9/26, 34 and 74.
- Based on PRO CUST 9/54.
- O.H. Ward, 'British burrstones, 1799-1821', *Melin*, 1 (1985), 33-47.
- As ref 8.
- J. Beauvois, *Les Moulins* (publication semestrielle de la Fédération française des Amis des Moulins), 4 (1980), 5-13. English translation in 'Millstone making in France: when Epernon produced millstones', *Wind & Water Mills*, 3 (1982), 32-35.
- It is a common local belief that the large number of millstones lying in the River Wye at this place (and clearly visible when the river level is low) indicates that many stones were accidentally dropped into the river while being loaded on to barges or 'trows'. This may be partly true, but I am inclined to believe that most were deliberately dumped in the river as faulty or unwanted. When the river was exceptionally low on 30 August 1976 I counted 16 millstones and two cider-mill chase-stone segments in a 1 km stretch of the river just below Redbrook; all but two of the millstones were on the Monmouthshire side of the river; the other side here is in Glos.
- It has been suggested that wooden protecting rims were fitted: see J. Butt, *Industrial Archaeology of Scotland*, Newton Abbot (1967), 95; 'apocryphal stories about the movement of millstones on temporary wooden circles manned by half the community, bowling their burden along, can still be heard in rural byways'. However, I have met no other evidence of this in Britain.
- See ref 10, especially pp 17 and 20.
- H. Gleisberg, 'Millstone quarries', *Trans 4th Symposium, The International Molinological Soc*, (1977), 177-80.
- The Miller*, 6 (4 Oct 1880), cover iii.
- Kelly's Directory, 1872 and 1888.
- E.A. Lewis, *Welsh Port Books, 1550-1603*, Cymmrodorion Record Series, 12 (1927), see pp 41, 70, 75, 83, 99, 101, 120 and 226.
- Advert in *Carmarthen Journal*, 16 April 1847.
- Third Interim Report of the Departmental Committee appointed to inquire into and report upon Certain Miscellaneous Dangerous Trades*, HMSO, (1898), 22-9 and 40-53.
- (a) 'The geology of the burr-stone', *The Miller*, 3 (1877), 70-1 and 120. (b) D.G. Tucker, 'Millstone making in Gloucestershire', *Glos Soc Industrial Archaeology J*, (1973), 6-16. (c) D.G. Tucker, 'Millstones, quarries, and millstone-makers', *Post-medieval Archaeology*, 11, (1977), 1-21 and Plates I-XIV. (d) O.H. Ward, 'French millstones', *Wind & Water Mills*, 3 (1982), 36-43. (e) D.G. Tucker, 'Millstones north and south of the Scottish Border', *Ind Arch Rev*, 6 (1982), 186-93. (f) O.H. Ward, 'The making and dressing of French-burr millstones in France in 1903', *Wind & Water Mills*, 5 (1984), 27-32.
- An example of their currency in the 18th century is an advertisement in *Worcester Journal* for 26 April 1781: 'To be SOLD by JOHN HARRIS, Millwright in Kidderminster, good FRENCH STONES'.
- Final Report on Dangerous Trades*, Home Office, HMSO (1900), 7.
- As ref 35(c).

39. The process as carried out in France is described in detail in ref 35(f). The danger to health is described in ref 37.
40. J. Roberts and R. Hall, *Guide to Stone Cross Windmill*, published at the mill, not dated but probably 1984. The maker's plate is illustrated in this booklet.
41. See refs 9, 10, 11 and 23.
42. See ref 8.
43. (i) E.C. Curwen, 'Querns', *Antiquity*, 11 (1937), 133-51.  
 (ii) E.C. Curwen, 'More about querns', *Antiquity*, 15 (1941), 15-32.  
 (iii) O.G.S. Crawford, *Archaeology in the Field*, 1953, Chapter 9, 'Querns and quern-quarries'.  
 (iv) S. Caulfield, 'The beehive quern in Ireland', *J Roy Soc of Antiquaries of Ireland*, 107 (1977), 104-138 (includes review of querns in Britain).  
 (v) R.H. Hayes *et al*, 'The distribution and lithology of beehive querns in North east Yorkshire', *J Archaeological Science*, 7 (1980), 297-334.
44. W.J. Arkell and S.I. Tomkief, *English Rock Terms, chiefly as used by Miners and Quarrymen*, Durham (1953).
45. VCH Yorkshire, Vol 2 (1912), 370.
46. *Ibid*, 380.
47. But not included in the source used for Table 6.
48. A. Raistrick, *West Riding of Yorkshire*, (1970), espec pp 124-28.
49. J. Reynolds, *Windmills and Watermills*, (1970), 13.
50. F.S. Wallis, 'Draycott stone and marble, Somerset', *Proc Bristol Naturalists Soc*, 32 (1973), 275-280.
51. D. Barrington, 'An account of certain remarkable pits or caverns in the earth, in the County of Berks', *Archaeologia*, 7 (1785), 236-43.
52. O.G.S. Crawford, *Archaeology in the Field*, (1953), 103.
53. As ref 9.
54. *Gloucester J*, 13 July 1812.
55. As ref 35b.
56. (a) C. Hart, *Industrial History of Dean*, Newton Abbot (1971), 297-9. (b) David Mushet in evidence, *Report of Commissioners, Children's Employment (Mines)*, Appendix to First Report of Commissioners (Mines), Part II, (1842), 25. (c) *Carmarthen J*, 16 April 1847; advert states 'millstones from the Forest of Dean' were on sale at Carmarthen Quay.
57. H.S.L. Dewar, 'The windmills, watermills and horse-mills of Dorset', *Proc Dorset Natural History and Archaeological Soc*, 82 (1961), 109-132, espec p 120.
58. H.E.S. Simmons, 'Watermills and forges on the Belne Brook', *The Miller*, (June 1947), 492-4. Fuller version in *Wind and Water Mills*, 1 (1980), 34-44 with introductory article by J. Briggs and G. Tucker, 'The mills and water-courses of the Belne Brook', *ibid*, 30-34.
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60. R.J. Gateley, *The Scythe Making Industry of Belbroughton*, University of Birmingham, Dept of Geography, Dissertation (1949), 38-9.
61. *Ibid*, also 30-31.
62. A.J. Holden, 'When stone was the life-blood of Alveley', in *A Belbroughton Miscellany*, ed M. Hinton and A. Spier, Belbroughton History Soc (1985) 50-52.
63. An old photograph (dating from 1901) of the process of making a 'millstone' at Alveley has been published: see U. Rayska, *Victorian and Edwardian Shropshire from old photographs*, (1977), photo no 55
64. R. Christian, 'Land of monastic pioneers: Charnwood Forest, Leics', *Country Life*, 11 Feb 1982, 334-6.
65. Post Office Directory of Leics, 1855 and White's Directory of Leics and Rutland, 1863.
66. See eg the display card for visitors at the car park at Mow Cop.
67. John Farey, *Derbyshire*, Vol 1 (1811), 220-1.
68. B. Job, *Staffordshire Windmills*, Midland Wind and Water Mills Group, Birmingham (1985).
69. Martin Watts, in private correspondence.
70. C. Morris (ed), *The Journeys of Celia Fiennes*, (1947), 225.
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73. C. Dickinson, 'Whittle stone', *Univ of Lancaster Regional Bull.*, 7, No 23 (1978). This is a precis of an article in the *Chorley Guardian*, (1928).
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76. As ref 72, second edition 1836, opp p 459.
77. As ref 71.
78. As ref 72, Vol 2 (1870), 585.
79. VCH Lancashire, Vol 8, 74-5.
80. J.R. Ford and J.A. Fuller-Maitland (eds), *John Lucas's History of Warton Parish, compiled 1710-1740*, Kendal (1931), 145.
81. R. Hunt, *Mineral Statistics*, List of Quarries (1858).
82. M. Davies-Shiel and J.D. Marshall, *Industrial Archaeology of the Lake Counties*, Newton Abbot (1969), 264.
83. As ref 81.
84. T. Eastwood *et al*, *Geology of the Whitehaven and Workington District*, HMSO (1931), 166 and Plate VA.
85. F. Atkinson, *The Industrial Archaeology of North-East England*, Vol 2, Newton Abbot (1974), 294.
86. As ref 81.
87. As ref 85, 302.
88. As ref 85, 101-2 and 284-6.
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90. Sources mentioned in J. Rickerby, 'The Newcastle grindstone industry', *Quarry & Surveyors' & Contractors' J* 27 (Jan 1922), 11-16.
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92. J.A. Sass, personal communication.
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