

MILLSTONE MAKING IN GLOUCESTERSHIRE

Wm. Gardner's GLOUCESTER MILLSTONE MANUFACTORY

with a note on HUDSONS of PENALLT and REDBROOK

D. G. TUCKER

Introduction: French burr-stones

Millstone making is, of course, a very ancient craft, and goes back about two thousand years as far as water-powered corn mills are concerned. Hand-operated mills were even earlier. In England it is over a thousand years old. For most of this period millstones were made in one piece out of suitable local stone, although certain types of stone acquired fame and were in great demand - notably the grit stones of the Peak District and the Welsh stones or quartz conglomerate (quartz pebbles embedded in an Old Red Sandstone) of eastern Monmouthshire.

As the Industrial Revolution developed in the 19th century, two things led to a change in the craft; firstly the very rapid growth of population which led to an enormous increase in the demand for flour, and secondly a large-scale demand for finer flour. These factors virtually changed millstone making from a craft to an industry, and necessitated the use of superior millstones for the final stage of grinding of flour. The English and Welsh stones were adequate for coarse grinding, but it was found that for fine wheat flour it was necessary to import French burr-stones. These had indeed been used in England for several centuries, but on a very small scale before the mid 19th century.

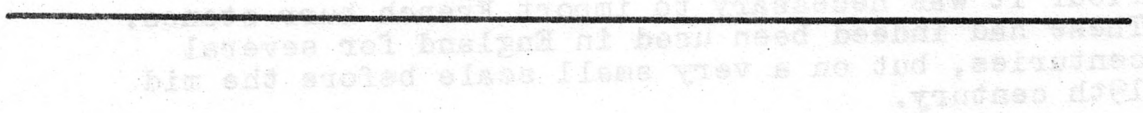
French burr-stone is a very hard rock containing irregular large and small cavities which keep the

any member interested in Netherlypiatt? If so they might like to concern themselves with a tenement with two fulling mills, and lands called the Moores, with entrance and egress to and from two racks standing in the Bourne Land, which in 1689/90, during the reign of William and Mary, was let for £10.15s yearly... "and a couple of good hens." (Glos. Library, Brunswick Street, Gloucester. Glos. Collection of Deeds. Bisley 46/3) A combination of map research and fieldwork might locate the site or even the building.

Our grateful thanks go to all the contributors to this years Journal. It is of particular interest to have professor Tucker's history of the Gloucester firm of Wm. Gardner. Perhaps our "advertisement" pages will inspire other members to research more local firms. I should also like to thank Mrs P. Lebbon who again helped me by typing a section of the Journal.

Although there seems to be a good deal of interest among members, sufficient material did not come in to warrant a section on the agricultural machinery of the county. But may we hope to defer rather than abandon this scheme?

In 1964 a group of members carried out a survey of Gun's Mill, a 17th century blast furnace, in the Forest of Dean. Rough drawings were made and Warren Marsh published brief notes on the history of the site in Newsletter No. 3 November 1964. It has always been hoped that someone would one day produce finished drawings. Earlier this year Ian Parsons took up his drawing board and has all but completed the work. We intended to print them in this Journal, but, with regret, postponed publication for twelve months, since it was felt that the area being one of considerable importance, was worthy of a more comprehensive project; one that would draw together all the known historical information on the site. May we hope that we can complete this for the 1974 Journal? Just ten years after the first measurements were made ! A fitting anniversary which will also mark the 10th year of our Society.



The Editorial does not necessarily express the views of the Committee.

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grinding edges renewed as the stone wears, and occurs chiefly around La Ferté-sous-Jouarre, just east of Paris. Unfortunately it has to be quarried in comparatively small pieces, so that a millstone has to be fabricated by the assembly of a number of pieces (e.g. 25), rather like a crazy paving, cemented together with plaster of Paris, the working face being dressed smooth and the rough back smoothed off with plaster, the whole being reinforced by iron hoops shrunk on to the circumference.

It was usual to import the separate small pieces of stone and do the assembly in England. Thus the making of this kind of millstone, unlike that of the English and Welsh stones which continued to be the work of masons at the quarries, became a factory job, and a large number of specialized firms grew up to undertake it. Among these one of the best-known was Wm. Gardner of Gloucester, the main subject of this article.

Manufacture of the complete stones was undertaken by a number of firms around La Ferté-sous-Jouarre, and a note on this has been published by Buckland (1). It does seem, however, that complete millstones were hardly ever (if at all) imported into Britain.

A large number of French burr-stones are still to be found around the country, and many, if not most of them have their makers' names clearly marked, either on cast iron rings fastened round the eye of the runner stones or on special name-plates embedded in the plaster of the back, or both. My wife and I are making a study of millstone makers, but as we still have fewer records of named stones than we have of the names of millstone makers, we would much appreciate receiving information on named stones which other people discover. It is curious how seldom the millstone-maker's name is quoted in any publication on old mills, and to the best of our knowledge no comprehensive study of millstone makers has previously been undertaken.

Millstone making in Gloucester

J.G. FRANCILLON

The first record we can trace of a millstone factory in Gloucester is the entry of "John G. Francillon, millstone maker, Docks" in Slater's Directory for 1852-3. In the 1858-9 issue of this directory, the address is given as Llanthony road. As Francillon retired in 1861, he may well have been carrying on this business for some (or even many) years before 1852. However, there is no

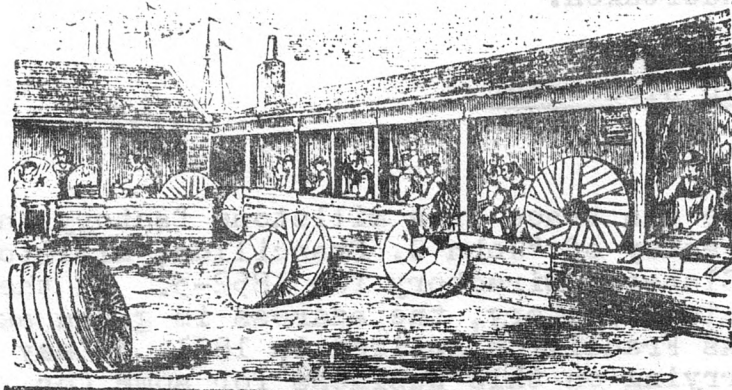
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millstone maker shown in Gloucester in Pigott's Directory for 1842. William Gardner, who was born around 1841, served his apprenticeship with Francillon, and rose to the position of manager by the time he was 20 (2). At this time the number of employees was, it is believed, around 20 (3).

WM. GARDNER

On Francillon's retirement in 1861, Gardner took over the business. By 1870 he was advertising as Wm. Gardner, Llanthony Road, Docks, Gloucester, and his advertisement in Kelly's Directory of Gloucester and Bristol for 1870 is particularly attractive, and is reproduced here as Fig. 1. The drawing shows a large number of workmen at work, and shows dressed millstones of the single-stone type, and completed and partly completed burr-stones. These latter appear as geometrically segmented types, which may once have been used although I have never met one. The common type was made of pieces of random shape and size, as shown in Fig. 2, which is based on a stone at Lidstone Mill, Oxfordshire. Note that the advertisement states that Gardner not only imports French Burrs and manufactures millstones, but also supplies Peak and Welsh millstones which he gets direct from the quarries. This question of Welsh stones is discussed later in this article.

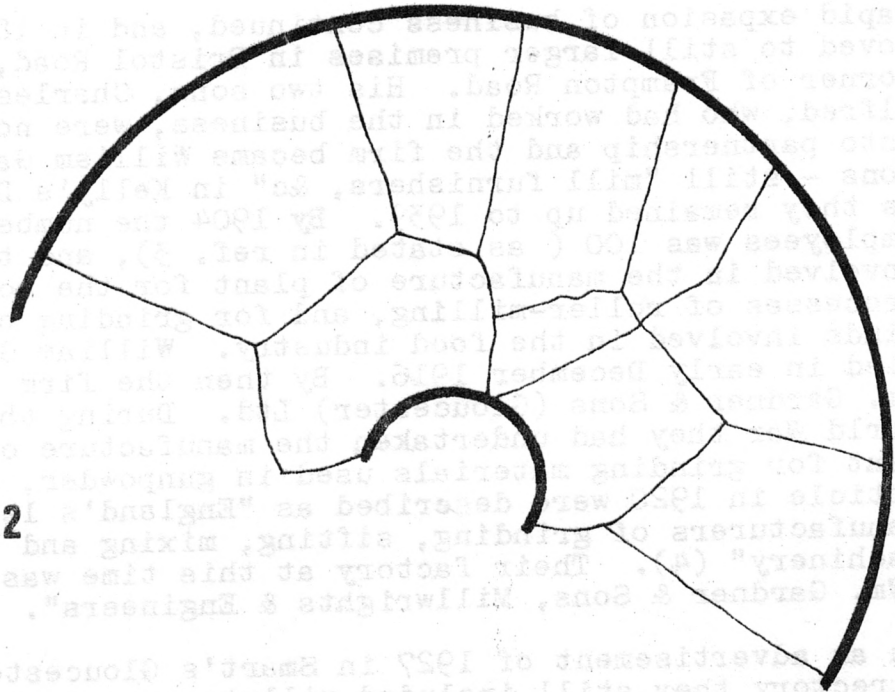
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WM. GARDNER,

**Importer of French Burrs, and
Manufacturer of Millstones for
Grinding all kinds of Grain, Bones,
Paint, Cement, Coprolite, Chemi-
cals, &c. Peak and Welsh Mill-
stones direct from the Quarries.
Flour Dressing and Smut Ma-
chines, Bolters and Bolting Cloths,
Machine Wire and Brushes, Cast
Steel Mill Pecks, Metal Provers
and Staffs, Sack Trucks, and all
kinds of Millers' Tools may be had
on the shortest notice. Prices of
any of the above may be had on
application. All orders for ex-
portation and by post promptly
attended to.**

**Llanthony Road, Docks,
Gloucester.**



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It is also clear from the advertisement that Gardner supplied all sorts of other equipment for mills. This was part of his planned expansion of the business. The obituary already cited (ref.2) stated that "with that energy and foresight which had characterised his whole career he soon (i.e. soon after taking over the business) entered very considerably upon developments and extensions which brought him conspicuously before the commercial community over a wide area. To the manufacture of millstones (which by implication had been the only concern of Francillon) he added an agency for the sale of various kinds of machinery to meet the changing needs of milling"

It is interesting, but probably not significant, that millstones are not mentioned in a whole-page advertisement which he placed in the Gloucester Directory for 1877, when he was still at Llanthony Road. He advertises a large stock of leather and other driving bands (with illustration), laces, fasteners, engine packing, tallow, grease, lubricators, jacks, pulley blocks, grindstones, &c. Perhaps grindstones included millstones!

By 1879, Gardner had moved to larger premises in Southgate Street, as shown in Kelly's Directory for that year. He was by then a "general mill furnisher and millstone manufacturer". By 1889, he was a "mill furnisher, &c." According to the obituary he installed plant in these premises for the manufacture of flour milling machinery.

Rapid expansion of business continued, and in 1894 he moved to still larger premises in Bristol Road, at the corner of Frampton Road. His two sons, Charles and Alfred, who had worked in the business, were now taken into partnership and the firm became William Gardner and Sons - still "mill furnishers, &c" in Kelly's Directory, as they remained up to 1939. By 1904 the number of employees was 100 (as stated in ref. 3), and they were involved in the manufacture of plant for the modern processes of roller-milling, and for grinding of various kinds involved in the food industry. William Gardner died in early December 1916. By then the firm was Wm. Gardner & Sons (Gloucester) Ltd. During the First World War they had undertaken the manufacture of equipment for grinding materials used in gunpowder, and in an article in 1920 were described as "England's leading manufacturers of grinding, sifting, mixing and blending machinery" (4). Their factory at this time was labelled "Wm. Gardner & Sons, Millwrights & Engineers".

In an advertisement of 1927 in Smart's Gloucester Directory they still included millstones amongst their products, but by 1939 this item had disappeared. It is almost certain that by 1927 the millstones would not be for flour milling, and would in any case be of the composition type, not of natural stone.

During the inter-war years, their activity was about equally divided between the food and chemical industries. (5). They have since further diversified, becoming Gardners of Gloucester Ltd., and a part of the Babcock and Wilcox group of companies. No longer is there a Gardner in the firm, but they are still proud of their long history.

When did Gardner stop making French burr-stones? I would like to know this, but so far have no good clue.

Two surviving pairs of French burr-stones by Gardner

Through the courtesy of Mr Wilfred Foreman, we were able to inspect two pairs of French burr-stones at the former Lidstone Mill in Oxfordshire. They were made by Gardner and have on the eye casting of the runner "GARDNER MAKER GLOUCESTER" as shown in my photograph in Fig. 3, and on four separate small plates set in the plaster "GLOUCESTER MILLSTONE MANUFACTORY" as shown in Fig. 4. Each stone is 47 inches in diameter; the bedstones are 9 inches thick, the runners 11 inches.

These are the only examples of Gardner's work that I

have come across, but Mr. J. Kenneth Major has been kind enough to inform me of two other mills using Gardner's stones: Shalfleet in the Isle of Wight, and Little Faringdon near Lechlade.

Unfortunately, none of Gardner's account books have survived as far as is known, so the origins and destinations of their materials and products cannot be traced directly.

Welsh stones: Hudsons of Penallt and Redbrook

We have seen that Gardner reckoned to supply Peak and Welsh stones as well as French burr-stones. On the subject of Peak stones, I can only refer the reader to the article by Radley (6). Welsh stones I have studied myself. I am assuming that by Welsh stones are meant the millstones produced in eastern Monmouthshire, in particular in the parish of Penallt, abutting on the River Wye opposite Redbrook (which is in Gloucestershire) and just below Monmouth. These stones are made of the quartz conglomerate (or pudding-stone, or jack-stone) which outcrops over a wide range of the parish (7). Bradney (8) states that they were known as Welsh stones, and it may be significant that the only entries for millstone makers that I have found in directories for Wales are those of the Hudsons of Penallt and Redbrook. Moreover, the trade of millstone maker at Penallt is a very old one; George Young was a "millstonhewer" in 1682 (9), and Thomas Young in 1740 (10). Nevertheless, it is hard to believe that the term "Welsh stone" is entirely unambiguous, as very good millstones were certainly made in earlier times in other parts of Wales, for example near Bridgend in Glamorganshire (11), and at Rhos Fawr in Anglesey (12).

Slater's Directory for 1850 shows Thomas Hudson, cider-mill maker, Redbrook. Kelly's Directory for 1884 and later years shows Noah Hudson, millstone maker, Penallt. The Hudsons were a large local family with numerous interests. Mr Len Hudson, born in 1902, is still alive and living in Redbrook, and has told me about their activities.

Mr. Len Hudson's father was George, the youngest of six brothers, the others being, in order of age, Elijah, William, Thomas, John, and Enoch. These six brothers carried on the millstone business following the tradition of the previous generation. They had other activities too, such as making eel baskets and truckles (or coracles, i.e. skin boats). For them the making of cider-mills was much bigger business than making stones for corn mills. There are certainly numerous cider-mills (some

in working order) remaining in the district, made of conglomerate stone, and many were certainly exported. The Hudsons owned their own barge on the River Wye, and sailed it to Bristol, whence stones were exported to other places, including France. An exceptionally large cider-mill, with the chase (or base) 11ft. diameter and in three pieces, in place of the usual 7ft. and two pieces, and the runners 5ft. diameter in place of the usual 4ft., was made to order for export to France. It was to be driven by two horses instead of the usual one pony or donkey. Unfortunately the order was cancelled, and the stones were dumped at the riverside, where they may still be seen on the Penallt bank a few hundred yards below the Boat Inn.

In the quarries and elsewhere are numerous abandoned, often unfinished millstones, and a fair proportion of these look as though they were intended for corn-mills, being thinner than cider-mill runners. It is possible that in earlier times, stones for corn-mills were more important than those for cider mills. Some typical old millstones at Penallt are shown in my photographs, Figs. 5 - 8.

The millstone business died away around 1875. The Hudsons went to work for the railway in the Wye Valley, which opened in 1876.

There are no written records of the Hudson's business, as none of them could read and write. Mr. Len Hudson states that he was the first Hudson to learn to read and write.

Where does Noah Hudson come into this? Mr. Len Hudson was very puzzled when I told him about the entries in Kelly's Directory. He insisted that Noah, who was a cousin of his father's, was deaf and dumb and could not possibly have been a principal in the business. The thought did just cross my mind that, being deaf and dumb, Noah might have had an incentive to learn to read and write, and thus be able to communicate with the editors of directories and perhaps do other clerical business for the family.

Mr. Len Hudson was certain that some of the stones went to Gloucester, by waggon via Newent, where he thought they were transhipped from one carrier to another.

Hudsons would not have owned all the quarries in Penallt, but they may well have been the largest operators. They would have been certain to have dealings with Francillon and Gardner at Gloucester.

The cost of millstones

A most important source of technical detail regarding millstones is a paper by Dewar (13), and he quotes the following as the cost of a pair of millstones in 1861:-

French burr-stones, 5ft. diameter, £70

Peak stones, 4ft. diameter, £30.

The price for Peak stones is high compared with figures given elsewhere for stones bought at the quarry. For instance, Hunt (14) gives the cost of a pair of stones at Burbage Moor Quarry near Sheffield as £7. He also (15) gives the cost of grindstones made from Forest of Dean Grey Stone as 2d per inch diameter up to 3ft.; and up to 7ft., from 10/- to £5 each. Perhaps Dewar's figure is for the finished stone delivered in Dorset. I have no figures for Gloucester.

These prices refer, of course, to millstones for corn mills. The cost of a complete cider mill, with the large and specially shaped chase stones, would have been many times the cost of a pair of millstones.

Another source of technical detail is a paper by Russell (16).

Conclusions

Two completely different kinds of millstone makers have been studied, both operating in Gloucestershire or its borders. Gardner was a progressive business man, developing his millstone manufactory, by way of merchandising of machinery, into a machinery manufactory; his firm still survives, although it is no longer independent. The Hudsons were independent rural craftsmen, and when their crafts were no longer wanted, they took up ordinary employment. There was almost certainly a business connection between the two firms.

French Burr-stones and Welsh stones (together with Peak stones) had their place in the history of milling, although quantitative data is hard to come by. Composition stones, of emery powder mixed with cement, had a small part to play in the later years of the 19th century, but the steelroller process was rapidly displacing all stone milling by the turn of the century (17). Nevertheless, stone milling is not quite dead, and, according to Dewar (see ref. 13), there is (or, at any rate, was in 1961) still a small residual market for both burr and Peak stones.

It is interesting that, right at the end of the era of flour milling by stones, another firm of millstone makers set up in Gloucester. It was W.D. Barron and Son of Sweetbriar Street, and later also of Ladybellgate Street. As far as I know, this firm never made Burr-stones or sold Peak and Welsh Stones. Their line in millstones was the composition type, as specified in their advertisement in Kelly's Director for 1919. No doubt they made emery-composition stones, but they also made stones with larger particles, like fine gravel, and one such stone, with cast iron makers' plates "BARRON & SON MAKERS GLOUCESTER" can, at the time of writing, be seen at Skenfrith Mill, Monmouthshire, grid ref. SO 458-202. The firm first appeared in directories early in the 20th century as Millwrights; their first entry as Millstone makers was in 1919 and their last in 1927. By 1939 they were Ironfounders, and continued as milling engineers and ironfounders right up to the present time.

Acknowledgments

Thanks are due to Mr. A.J.I. Parrott, City Librarian, Gloucester, for finding some most useful references for me; to Mr B.S. Smith, County Archivist, for assistance in obtaining Fig. 1; to Mr. P.H. Bowen, Managing Director of Gardners of Gloucester Ltd., for information regarding the firm; to Mr. Wilfred Foreman of Oxford for drawing my attention to the stones at Lidstone Mill and arranging for me to inspect them; to Mr. J.K. Major for information regarding stones; and to Mr Len Hudson of Redbrook for information regarding his family and their activities.

References

- 1 J.S. Buckland, Millstones, 1, 1970, pp.11-12.
- 2 See obituary of William Gardner in a local paper, preserved in Gloucester City Library Cuttings Book, 1916, pp.483-4.
- 3 Information from article on Wm. Gardner & Sons in "Industrial Gloucestershire", Chance & Bland, Gloucester, 1904.
- 4 In "Gloucestershire: the story of successful endeavour in the task of reconstruction", Chance

- and Bland, Gloucester, 1920, p.36.
- 5 Short note issued by Gardners of Gloucester Ltd, Jan. 1972.
 - 6 J. Radley, "Peak millstones and Hallamshire grindstones", Trans. Newcomen Soc., 36, 1963-4 pp. 165-173.
 - 7 For information regarding the quarries and products, see D.G.Tucker, "Millstone making at Penallt, Monmouthshire", Ind. Arch. 8, 1971, pp. 229-239. The present account is mainly additional to the information given there.
 - 8 J.A.Bradney, A History of Monmouthshire, "The Hundred of Trelech", Vol.2, part 2, 1913, p.155.
 - 9 Indenture of May 1 1682, Monmouthshire County Record Office D.309.1.
 - 10 Probate of will, 28 March 1740, *ibid*, D.309.4 .
 - 11 Diaries of W. Davies, No XXIII (about 1811) Nat. Lib. Wales, MS no. 1762
 - 12 Sean Hagerty, "600 years of an Anglesey mill", *Country Life*, 22 June 1972, pp. 1606-7.
 - 13 H.S.L.Dewar, "The windmills, watermills and horse-mills of Dorset", Proc. Dorset N.H. & Arch.Soc., 82, 1961, pp. 109-132.
 - 14 R.Hunt, "Mineral Statistics", 1858-9, p. 195.
 - 15 *ibid*, p. 158.
 - 16 J.Russell, "Millstones in wind and water mills", Trans. Newcomen Soc., 24, 1943-4, p.55.
 - 17 See W.R.Voller, "Modern Flour Milling", Gloucester, 1897 (2nd edition)

Illustrations

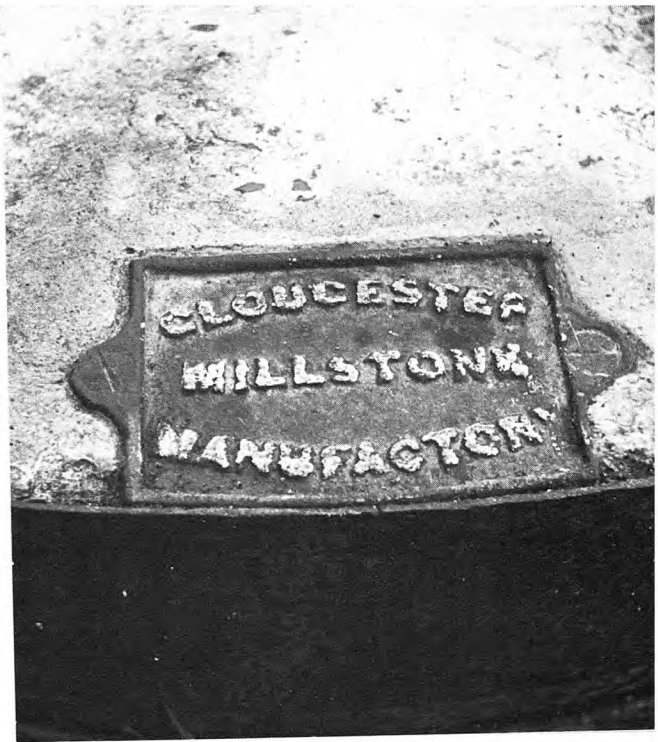
- 1 Wm. Gardner's advertisement in Kelly's Directory for 1870.

- 2 Sketch showing typical random pattern of burrs in a Gardner's French burr-stone at Lidstone Mill.
- 3 Eye casting with lettering GARDNER MAKER GLOUCESTER in French burr-stone at Lidstone Mill.
- 4 Plate set in plaster back of the same French burr-stone with lettering GLOUCESTER MILLSTONE MANUFACTORY.
- 5 Chase-stones in quartz conglomerate of an old cider-mill at Penallt, showing clearly the two halves. These are in situ, the building which covered the mill having long-since been demolished. I possess a deed dated 14 May 1850 relating to this mill; it actually includes a map of the site.
- 6 This stone lies in the quarry at Penallt at which it was made, apparently undamaged. Its purpose was a puzzle for a time, but Mr Hudson explained that the chase-stones of cider mills were always made like this at the quarry. When the stones were set up at the mill, the circular channel was completed by the removal of the material across the diameter; this removal was left till last so that the edge between the two halves of the chase could be perfect, undamaged by rough handling in transit.

It is worth noticing that some chases have the central raised circular piece integral with the chase, while others, like the old one of Fig.5, had it added as a separate stone.

- 7 Runner stone of a cider mill
- 8 A stone, probably intended to be a corn-mill stone, abandoned at Penallt at a very early stage of construction.
- An iron tool has been left at the centre.

N.B. The white ruler in Figs. 6 and 8 is 1 ft in length.



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