

AYRSHIRE HONE-STONES

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AYRSHIRE HONE-STONES

The Water of Ayr and Tam O'Shanter Hone Works
at Stair and the History of the Industry in Britain

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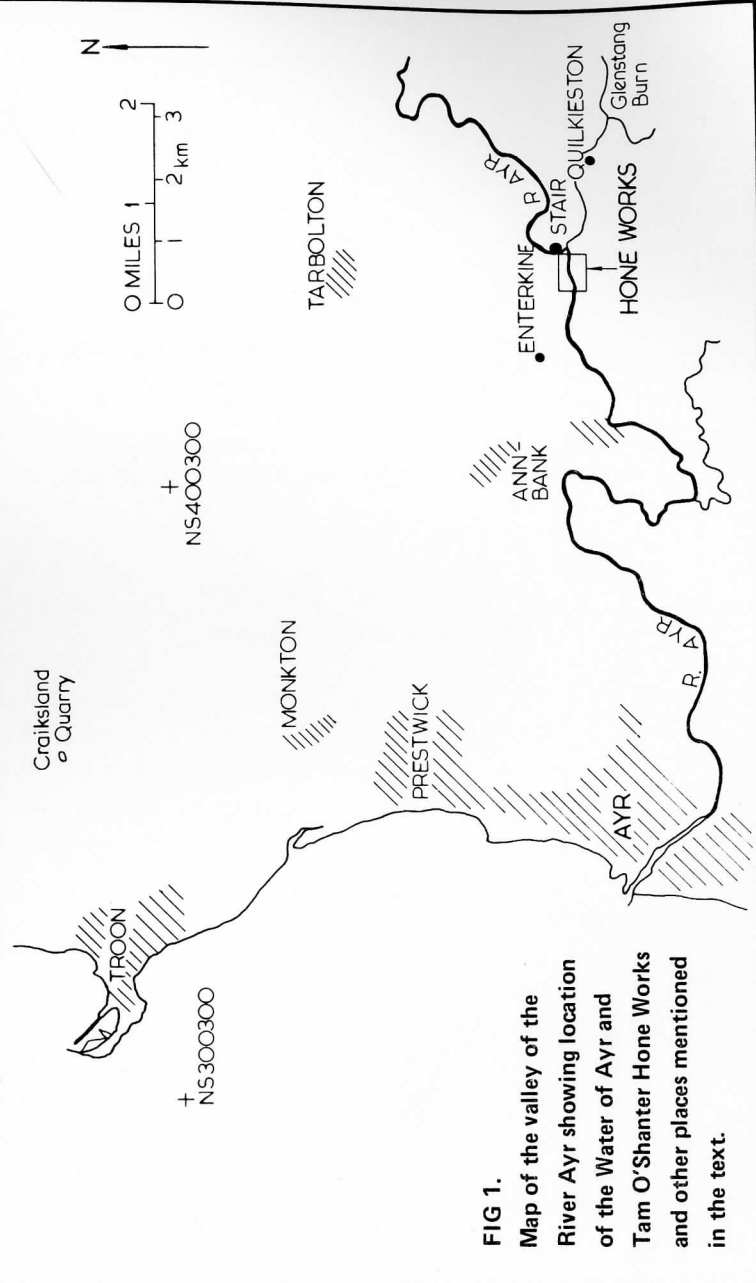


FIG 1.
Map of the valley of the
River Ayr showing location
of the Water of Ayr and
Tam O'Shanter Hone Works
and other places mentioned
in the text.

In Britain the most important, and for some relatively recent periods the only hone-stone mine and works has been the Water of Ayr and Tam O'Shanter Hone Works at Stair, about six miles east of Ayr in Scotland, as shown in the map in Fig. 1. This works is still in operation; its products are still purchaseable in the appropriate tool trade, and a large proportion is exported. Its known history gives it an age of about 200 years, and there is a continuous family ownership or management over this period; indeed for the last hundred years it has been in the control of one branch of the Montgomerie family. For a long time the works used only water power; then steam was used at the mine; and now everything is electrically-driven. At first the stone was quarried, but for about a century it has been mined. This small and little-known, but important, industrial enterprise is the main subject of this paper. It is, however, necessary to give first some background.

The hone-stone industry in Britain is very far from being well-known, the widespread use of carborundum and emery during the present century having tended to obscure the fact that natural stone is still used for fine sharpening and polishing. Carborundum, or silicon carbide, is artificially produced in the form of small crystals of very great hardness which can be bonded together to form a hard and hard-wearing sharp grinding stone which for most purposes is both better and more economical than the natural stones it has so largely displaced. Emery wheels, sticks, paper, etc., which are also much used, are similarly fabricated by consolidating the powdered material with a bonding medium, but in this case the material is naturally-occurring impure corundum, which is aluminium oxide with iron oxide. Silicon carbide is used for non-ferrous applications and for most hand sharpening stones. Emery is gradually being replaced by aluminium oxide artificially made in electric arc furnaces, which is used

in engineering for grinding all ferrous material and makes the most popular grinding wheels, being tougher but not so hard as silicon carbide. However, for the finest sharpening of razors, surgical instruments, etc., and for the fine smoothing of metal, such as engraving plates and moving parts of rifles, etc., a softer and smoother natural stone is still mined and processed into hones of various sizes and shapes, and is in demand all over the world.

WHETSTONES, SCYTHER-STONES AND HONE-STONES

1. Introduction

In studying the hone-stone industry generally, great difficulty is produced by the variable terminology used in the past. The term 'whetstone' has been used in a broad way to include any hand-held sharpening or polishing stone; indeed it has occasionally been stretched to include also rotary grindstones. A hone is a stone of smooth fine texture used for giving a very fine edge or polish, and is strictly a special kind of whetstone, but the term 'hone' or 'hone-stone' has been (and, indeed, still is) sometimes used in the generic sense of 'whetstone'. A 'scythe-stone' is a stone of much more closely-defined shape — a thick stick about a foot (30 cm) long, probably tapering towards each end — and of considerably coarser texture; it, too, is in the genus 'whetstone', but the term 'scythe-stone' is never used as a synonym for 'whetstone'. Hones are most commonly used in the form of a rectangular block or stick, but triangular, circular, and other cross-sections are made; and disc-type hones intended to be used in a rotary mode are also important. Hone-stone as a material is usually a sedimentary rock (mudstone or slate) which has been subjected to a natural baking and hardening process, but it will not be excessively hard. Occasionally a very fine-grained sandstone can be used for making a coarser type of hone. Scythe-stones are made of fine sandstone or gritstone, and are too coarse to be properly termed hones or hone-stones. Rotary stones of the same material as scythe-stones would be called 'grindstones', or even 'millstones' in some applications.

The use of natural stone for sharpening and polishing must be as old as the use of edge-tools and weapons. The selection and shaping of stone which was particularly suitable for specialised uses became the practice, and led to a considerable trade, for good sources were not numerous. Whetstones generally were objects of international trade, certainly by the 18th century. Records are comparatively

scarce, but for the year 1839 the Customs records have been full enough to enable Table 1 to be compiled.

TABLE 1
'WHETSTONES' EXPORTED FROM BRITAIN IN 1839

DESTINATION	From ENGLAND		From SCOTLAND	
	Number	Value (£)	Number	Value (£)
Russia (N. Ports)	300	2		
Sweden	150	2		
Prussia	24	1		
Hanseatic Towns	1,040	74		
Holland	100	1		
France	1,204	39		
Isle of Man	1,044	5		
Channel Islands	2,860	23		
Cape of Good Hope	560	27		
E. India Co. Territories	2,000	24		
New South Wales	1,200	22		
Van Diemens Land	2,000	36		
Swan River	60	1		
South Australia	80	1		
New Zealand	100	1		
Newfoundland	1,252	14	240	2
Canada	1,600	19	616	10
New Brunswick	320	11		
Nova Scotia	325	?	275	?
Jamaica	40	1		
West Indies: St. Thomas	150	?		
U.S.A.	10,872	?		
Brazil	500	?		

Data extracted from Customs Books at Public Record Office, ref. CUST 8/49 and 50.

Values rounded off to nearest pound.

It will be seen that, while the exports of whetstones from Britain are not of very great bulk or value, they are very widely-distributed over the world, reaching every continent. It is thought that the apparently small exports from Scotland are accounted for by the re-export of Scottish stones from English ports.

Although detailed accounts of the use of hones are uncommon, one trade in which they were important does have its literature — namely leather making and dressing. The currier's knife, by which he prepares the surface of a skin, has to be most carefully sharpened, and according to Watt¹ this is done in three stages:—

- (i) accurately shaping the bevel of the knife-edge on a 'rub-stone', generally made of sandstone; this leaves a fine thread or 'wire' on the edge and also fine scratches on the steel;
- (ii) largely removing the 'wire' and completely removing the scratches by a 'clearing stone' of very fine grain; and
- (iii) removing the residual 'wire' by a steel.

In a later account by Lamb,² stage (iii) is carried out by the clearing stone used in a different mode. Evidently the clearing stone is what we have defined as a hone. Watt says it should be a Scotch or Welsh stone. Lamb says there are three kinds used in the trade, the Welsh stone (which he criticises as having a tendency to irregular formation and excessive hardness), the Water-of-Ayr, and the American (which he strongly recommends 'because of its uniformity of structure, and its low price, fourpence per lb.,') Of the Water-of-Ayr stone he says:—

'The Water-of-Ayr stone is a square with the corners taken off. It is an excellent stone for fretting (i.e. the knife will bite upon it properly) and giving a very keen edge. A serious drawback to its value, however, as a

clearing stone, is its tendency to split, especially in view of its high price, tenpence per lb.'

The different kinds of hone-stones available for the whole variety of applications appear to have been first listed and described by Knight, who donated a collection of samples to the Society of Arts, together with a descriptive catalogue,³ in 1836. Unfortunately the Society has not retained the collection, but the catalogue as published is most useful, and, indeed, formed the basis of most encyclopaedia articles on 'hone' for about a century.⁴ Many of Knight's samples were not named in the catalogue, and cannot now be identified; but of those named, and which are evidently hone-stones in the strict sense (for Knight included mill-stone and scythe-stone material too), his order of merit appears to be

- (i) Turkey oil-stone; its origins unknown except that it was exported from Smyrna.
- (ii) German razor-hone, occurring as a yellow vein in the slate mountains near Ratisbon.
- (iii) Ayr-stone, Scotch-stone, or snake-stone 'is most in request as a polishing stone for marble and copper-plates, but the harder varieties have of late been employed as whet-stones.'
- (iv) Charley Forest-stone 'is one of the best substitutes for the Turkey oil-stone, and much is request by joiners and others, for giving a fine edge.'
- (v) Idwall, or Welsh oil-stone, 'is generally harder, but in other respects differs but little as a whet-stone from the Charley Forest; but in consequence of its being more expensive, is in less general use.'
- (vi) Devonshire oil-stone . . . 'deserves to be better known'.

Of the British stones, the 'Ayr-stone' is the subject of Part II of this paper. The Charley Forest and Welsh stones

will be dealt with immediately below, and the Devonshire stones in Section 3.

It is clear from the above that some hone-stone was imported into Britain. Little information has so far been found on these imports. Some information is available on the production of whetstones, hone-stone, etc. in foreign countries, thus in 1899:—

Bavaria produced 81 tons of whetstones, valued at 4800 marks.

Belgium produced 82,100 hone-stones and scythe-stones valued at 70,800 francs.

Turkey exported 16,051 tons of emery, valued at £56,742, from Smyrna.

U.S.A. produced oil stones valued at \$208,283.⁵

The Bavarian and Belgian quantities were quite small, but clearly the production of emery and American oilstones was relatively large, although we have no figures for total British production to serve as a basis of comparison.

It is certain that foreign imports into Britain were a serious competition for British producers, for in about 1915 the Water of Ayr and Tam O'Shanter Hone Works provided a new catalogue with the comment:—

'In consequence of the terrible war now raging on the Continent, we take this opportunity of issuing a New Edition of our Catalogue of the celebrated "Scotch Hones", and trust we may be able to capture some of the trade formerly carried on by Germany and Austria-Hungary.'⁶

At the present day, with synthetic abrasives practically replacing natural stone, the 'Arkansas' oilstone from the U.S.A. maintains a market and, although much more expensive than Water-of-Ayr and Tam O'Shanter stone, is a

very serious competitor, even in Britain.

2. Hone-stone making in England and Wales

Knight mentioned Charley Forest-stone (iv in list above) and said it had been found only 'on Charnwood Forest, near Mount Sorrel, in Leicestershire'. Tomlinson (*Cyclopaedia*, 1854) goes a little further, and says: 'The best variety is said to come from the Whittle Hill quarry, the other stones in the neighbourhood being more pinny, i.e. presenting hard places.'

A little later, White says: 'The celebrated "Charley Forest Whetstones" are got near Woodhouse Eaves, and in other parts of the forest'.⁷ Elsewhere he says, referring to Charnwood Forest (for which Charley is an alternative name and the name of the parish): 'On the North, at Moorley Hill, the slate passes into a grit or gray wacke, which becomes finer southwards. The upper and more eastern beds are also finer. At Whittle Hill the grain is such as to furnish good hones for sharpening knives'.⁸

Whittle Hill quarry is entered by Hunt in 1858 as producing 'hones for sharpening fine cutlery and for carpenters' tools; used also for building'. 'Price at quarry £7 per ton, clipped but not dressed; average annual produce 20 tons'.⁹

Clearly Whittle Hill quarry was the English hone-stone producer; its location is at grid reference approx. SK497158, but the trade in Whittle Hill hones has long been dead.

Hones were also made in North Wales. Knight mentioned 'Idwall' oil-stone; this name comes from Llyn Idwal in Snowdonia, but the hones were made in various places in that mountainous part of Wales. As, unlike the English and Scottish hone and scythe-stone industries, the Welsh industry has had some relatively recent attention in the literature, little will be said about it here. Davies has described how the hone-stone quarries (often associated with or near slate quarries) were accompanied by water-powered mills for processing the stone into finished hones.¹⁰ The industry supplied a local market, and by the 1960s had died out.

Altogether there had been some 8 to 10 hone-mills, so it was a sizeable industry, but it was never listed in Mineral Statistics and little is known of its production. It has recently been revived, using suitable stone from the slate mine at Aberllefenni and processing the stone in a manner somewhat similar to that described in Part II for the Water of Ayr and Tam O'Shanter Hone Works in Scotland, except that planing machines appear to be used in place of the lathes.¹¹ Its product has the trade name 'Dragon's Tongue'.

3. Scythe-stone manufacture

Although this paper is principally about hones and hone-stone, yet, as explained in section 1, the terminology is so confused that it has seemed wise and useful to include a summary treatment of the scythe-stone industry. It is clear that Knight, as discussed above, included the Devonshire stones as hones (item vi in the list in section 1), although, as he mentions the neighbourhood of Tavistock as the source and the supply as poor, he is probably referring to a product different from the relatively well-known Devonshire scythe-stones or 'batts'. Fitton gives an account of the sources and production of these latter,¹² and his account of production methods is so interesting that it is reproduced from the original text in Fig. 2.

In Appendix 1 is summarised the information on scythe-stone sources in Britain that has so far been found by the author. It will be seen that the industry was widespread. It is believed that no scythe-stones made from natural stone are now produced.

FIG. 2

The manufacture of scythe-stones in Devon
as described by W.H. Fitton in
TRANS. GEOL. SOC. LONDON, 2nd series, 4, 1836.
(Facsimile of original text)

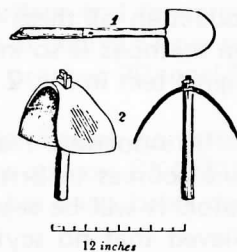
Sithe-stones.—As the manufacture of these stones occupies a great number of the inhabitants of the country, and is of some commercial importance, a large proportion of the whole quantity used in England being supplied from the Blackdown pits, I shall here describe the method of preparing them.

The *sithe-stone* men take from the owners of the soil the privilege of digging for stones, leaving 40 yards on each side between the drifts (or "pits" as they are called). There is no limitation as to depth, and the drifts are commonly pushed to about 500 yards inwards, greater distances not repaying the labour of bringing out the sand. When first taken out, the stone is greenish and moist, and can be cut or chopped with ease. The tools employed are a sort of axe or adze with a short handle (fig. 2.), called a "basing-hammer", which is ground to a sharp edge. These are made at the adjacent village of Kentisbere. The other tools are "picks", without any peculiarity of structure, and "hollowing-shovels" (fig. 1.), for digging the masses of stone out of the sand.

For the purpose of cutting the stones, a vertical post of wood, or "anvil", is so fixed in the ground as to stand between the knees of the workman, who sits upon a sort of bench built of stone, with some strong pieces of old leather attached as a defence to his left knee. He first, with the edge of his "basing-hammer", splits from the blocks, upon his knee, long portions approaching to the shape of the *sithe-stones*†; and then cuts or chops them down, nearly to the required size, upon the anvil and his knee,—just as a carpenter cuts timber with an adze. After being thus rudely shaped, the stones are "hewn" to the proper dimensions with a larger "hammer", and then rubbed down with water by women, on a large stone of the same kind; and when dried they are fit for sale.

The stones when finished vary from about ten to twelve inches in length; some have the shape of a portion of an almond, with the ends and sides cut square, and about 2 inches by 1½ in thickness; others are almost cylindrical, but smaller at each end, with the sides a little curved; the diameter in the middle about 2 inches.

A good workman can cut out of the blocks about seven dozen of the stones per day. They are sold by the makers chiefly to one merchant at Honiton, who supplies the retail dealers. The prices (in 1825) varied from 2s. per dozen, for the finest stones, 11 to 12 inches long, down to 8d. a dozen for the coarsest, 10 inches in length.



PART II

THE WATER OF AYR AND TAM O'SHANTER HONE WORKS

1. Location: Quarries, Mines and Mills

As we shall see below, the history of the hone-stone works invokes some unresolved questions about the ownership and location of some of the sources of hone-stone at early periods. There seems little doubt, however, that the present hone-stone mine at Dalmore (NS432232) in the parish of Stair is a development of the original hone-stone quarry described in 1793 thus:

'In the lands of Dalmore, upon the banks of the river Air, is a species of whetstone, well known in the country by the name of the Water of Air Stone: it has been exported to different parts of Europe and America and has been found preferable to every other stone for sharpening edge tools.'¹³

A century later in 1884 a local man, James Arthur of Privick Mill, in Rab the Ramblers's *Rambles on the Banks of Ayr*, visited the scene:

'By and bye we come opposite Dalmore Hone Quarry, where the celebrated Water of Ayr whetstones are dug. The quarry is a great work, as the fame of these stones are world wide. It has proved as good as a gold mine to the lairds of Dalmore. We question if any gold mines have proved as uniformly successful. A little farther up is the hone mill, where the stones are cut and polished. The power is derived from the Ayr. The mill is a considerable building, and there are large stores for the cut and the uncut stones.'

This is now the only source of hone-stone worked all the year round. Its stone is extremely fine-grained, consisting of a mixture of quartz and white mica in almost equal proportions, with grain size in the region 0.025-0.05mm; its special

properties appear to depend on texture rather than mineral composition.¹⁴ It is said to be a naturally baked and hardened shale known locally as 'calmy blaes'.

Some 1.3 km to the east of this site is another hone-stone mine (NS445231) known as Meikledale mine, shown as a Honestone Mine on the 6 inch geological map of 1966. The stone here is finer but less pure than that at Dalmore, and there is some demand for it still so that it is occasionally mined. This mine was opened in the 1920s, and was not a development of an earlier quarry, although what was probably a pocket of hone-stone was reported from this area in 1841¹⁵ (The area was then defined as in the direction of the Glenstang burn.)

Mr. Kenneth Montgomerie, the present Managing Director of the hone works, understands that there was another hone-stone quarry further up the Glenstang burn on Quilkieston Farm, which was worked from about 1881 until the stone was cut off by a fault in 1926. The quarry was called Meikledale until the mine of that name replaced it; it was then filled in. Its location was at approximately NS451234.

There was a quarry at Enterkine (north of the river Ayr, in the parish of Tarbolton), mentioned as a hone-stone quarry in the Memorandum of Association of the Water of Ayr and Tam O'Shanter Hone Works Ltd., when the company was formed in 1900.¹⁶ This may have been the 'Old Quarry' at NS421240 marked on the 6 inch geological map of 1966 as 'very hard pale grey baked mudstone'.

In the early days the amount of hone-stone produced was small, and it is recorded that in 1841 only two men were employed, one in the quarry and one in 'stripping and polishing (both of which operations are performed by machinery)'.¹⁷ It is probable that the latter process was done in part of Wm. Heron's corn-mill, built in 1821, since this had a large waterwheel and probably adequate spare power. This mill, at NS435234, on the south side of the river, is still used as part of the hone works. Being part of the Dalmore Estate, it

would have been associated with the Dalmore quarry. The stone from the other quarries would have been processed, in so far as machine sawing was needed, at Milton Mill, NS436235, on the north bank of the river.

It is an interesting tradition of the industry that when the hone-stone was worked from open quarries, the operation was a summer one only; the face of the quarry was covered with earth during the winter to prevent the frost from splitting the damp stone.

Other fairly-local sources of potentially-competing polishing stone were¹⁸

- (i) a 10 ft. bed of 'Water of Ayr Stone', consisting 'for the most part of material similar in appearance and quality to that mined at Dalmore', occurring beneath Troon Harbour Sill (approximately NS3131), and not commercially exploited;
- (ii) a fine-grained grey sandstone quarried in Craiksland Quarry (NS355318), which was commercially exploited, with a considerable foreign trade. The quarry was not worked by the company at Dalmore, but its stone was processed by it and sold as 'Ayrshire Blue Stone', intended to be used for preliminary removal of large blemishes and scratches before the use of Water of Ayr stone.

2. History of Water of Ayr Stone and of the Works and business.

We have already quoted the reference to Water of Ayr stone given in 1793 in the Statistical Account of Scotland. The mention of its wide export suggests that it had been available for a long time; it could hardly have become so well-known in only three or four years. Yet the present firm has always claimed that its quarry, i.e. Dalmore Quarry, commenced work in 1789. The explanation is probably that the stone was originally found in the bed of the river Ayr (or Water of Ayr). The quarry was leased to the Smith family of

Mauchline who later made decorated wooden ware, such as snuff-boxes, 'beautifully jointed and varnished; and everywhere in the highest estimation':¹⁹ and supplied wooden mounts and boxes, of high quality and often with decoration, for the hone-stones. At some time before 1815 William Heron had come into possession of the Dalmore estate, and in 1815 evicted the Smiths from the quarry and started to work it himself. As already stated, he built the mill in 1821. He was succeeded by James Heron in 1830, who died in 1849.

During this early period, the Water of Ayr hone-stone improved its reputation 'presumably at least partly due to better processing: 'both the raising and the dressing of the stone have been conducted with much greater care and neatness than formerly'.²⁰ In 1819 it was listed by Rees as a grindstone but not as a whetstone.²¹ In 1832, 'finely pounded water-of-Air-stone' was suitable to be used on a brass hone to give an 'exquisite edge' to 'razors, lancets, and other fine-cutting instruments'.²² In 1836, Knight ranked Ayr-stone below Turkey-stones and Charley Forest-stones,²³ and his assessment was copied in later encyclopaedias.²⁴ However, by 1858, Robert Hunt²⁵ gave special praise to 'Water of Ayr Hones' (not accorded by him to any other sharpening stones produced in Britain) thus:—

'Great quantities of these Hones are annually exported to Paris, New York, Melbourne, and other Foreign parts and they are highly valued in this country.'

One would like to find documentary evidence of these great exports, but the Customs books which have survived rarely enter 'whetstones' separately (and never 'honestones'). In one year (1839) when there were separate entries for whetstones (discussed elsewhere in connection with Table 1), the exports were shown as almost exclusively from England (about 26,000 stones valued at over £300 as compared with only 1131 from Scotland valued at about £15).²⁶ Moreover, the few direct exports from Scotland were all to those colonies which are now Eastern Canada. One must suppose that almost all the Water of Ayr exports were re-shipped from English ports.

After the death of James Heron in 1849, the estate passed to William M'Kie, who must have been a very close relative, for his name appears on the same tombstone as that of William Heron.²⁷ Nevertheless, his inheritance was disputed, apparently unsuccessfully; in 1851 the following advertisement appeared:—²⁸

'Intimation is Hereby Given that the HEIR at LAW of the late James Heron Esq. of Dalmore is about to institute proceedings in the Supreme Court for Reducing and Setting aside the Service and Titles of Mr. Wm. M'Kie, residing at Knowe, near Ayr, who is wrongously in possession of Mr. Heron's Estates . . . '.

The whole matter of the ownership and management of the quarry and works at this period is very unclear, and it is not known who the 'Heir at Law' was. William M'Kie died in February 1857. In Hunt's *Mineral Statistics* for 1858, which would, of course, have been based on data collected rather earlier, two Water of Ayr hone-stone quarries were bracketed together with a blank under the heading 'Freeholder' and M. M'Kie under the heading 'Quarryman'. If we assume that the initial 'M' was a misprint for W. then it would seem that Wm. M'Kie remained in possession of the quarry at least, even if not of the whole estate. If, on the other hand, the 'M' was correct, this might indicate the identity of the challenger, the 'Heir at Law'.

Mr. Kenneth Montgomerie says that his family papers indicate that Wm. M'Kie's daughter married William Dunn, who was working the quarry from 1850 (as manager for M'Kie perhaps?) and came into possession of the estate at M'Kie's death by virtue of being the husband of the female heir. Dunn died in 1868, and the estate, with the quarry, was then managed by his widow, probably as trustee for their daughter, until 1876.

A very curious feature of the matter is that in July 1850 the whole property was advertised for sale, 'together with the valuable WATER OF AYR HONE QUARRY . . . and the Mill and Houses connected with the said Quarry'.²⁹ Three

months later, Wm. Pettigrew of Stair Bridge, by Tarbolton, Ayrshire, advertised as follows:—

'WATER OF AYR HONES

The Subscriber begs to inform the public that he has purchased from the Heirs of the late JAS. HERON Esquire of Dalmore, part of that Estate on which is situated the celebrated WATER OF AYR HONE QUARRY, and has discovered on his property an extensive vein of that Stone, equal if not superior to any before known. From the facility with which the stone can be raised, purchasers will be supplied at prices much below those usually charged, and others shall at all times meet with prompt attention.

JAS MILLER, Esq., Merchant, Ayr, has been appointed my sole Agent, to whom all orders are to be addressed.

LIST OF PRICES

CURRIERS' BLOCKS	30s p cwt
JOINERS' DO.	20s "
SMALLER DO.	18s " "

There seems no doubt that Pettigrew intended to convey the impression that he had purchased the main quarry. However, Mr. Montgomerie understands that Pettigrew had actually purchased only that very small part of the estate called Bridgend on the south side of the river between the road at Stair Bridge and the Glenstang Burn, and that he was the innkeeper of the inn there. If his words are read carefully, he does not actually say that he owns the Water of Ayr Hone Quarry, and it is possible that he found an area in the bed of the burn with some good hone-stone. Mr. Montgomerie says that there is an oral tradition in his family that local workers 'salted' the area with pieces of good hone-stone as a joke. But it is all very confusing to the historian.

We come to certainty in 1876, for in that year the Dalmore Estate came into the Montgomerie family. John Cuninghame Montgomerie had married Dunn's daughter in

that year, and become the owner of the property. He worked the quarry, and was shown in 1878 as 'hone manufacturer, Stair' although he also appeared under 'Gentry' and 'Farmers'.³¹ In 1893 he was at the 'Water of Ayr and Tam O'Shanter Hone Works, Stair', and he continued there as proprietor until 1900. He built a new Dalmore House to replace an earlier one, but it was burned down in 1958 and now survives only as a ruin.

Competition with the Dalmore Quarry began early, and was more serious than the Pettigrew affair. After the Smiths had been displaced from the Dalmore quarry in 1815, they began to work the Enterkine quarry, selling the stone under the name 'Ayrshire Hone'; it was considered of lower quality than that from Dalmore, but remained in production for about a century. In 1852 the directory gives Hugh Brown as 'hone manufacturer, Milton' — Milton being the name of the hamlet to the north of Stair Bridge. Nothing more is known at present about Brown, but his stone was probably quarried at Enterkine. By the 1890s the competing firm at Milton was Donald and McPherson, 'hone manufacturers' in 1893 and 1899, according to the directories. However, it seems fairly certain that the Milton firm was really G. McPherson & Co., Donald and McPherson being a Glasgow firm of ironmongers which had started as J.A. Donald & Co.; Donald took McPherson into partnership when he became a major supplier of hones to the firm.

Gilbert McPherson was a mining engineer and ran a coal mine at Machrihanish in Kintyre; he is believed to have come to the Stair district about 1880 to start a coal mine for a Mr. Galloway at Trabboch, nearby, and to have married Pettigrew's daughter. He is supposed to have found hone-stone at Quilkieston and to have started the quarry there about 1881. At some time before 1900, his company became G. McPherson Junior & Co; presumably this means that his young son took over his hone-stone interests. We shall see below that he worked the quarry at Enterkine as well as that at Quilkieston, which he called Meikledale.

J.C. Montgomerie was evidently troubled by the fact that his local competitors produced inferior hones but also sold them under the name Water of Ayr Stone. Apart from the forceful wording on the labels which Montgomerie stuck on his hones (described in a later section), and his adoption of the name Tam O'Shanter Stone, he sent a printed letter to his customers in January 1885 stating his prices and that he would in future supply his stones direct to his customers.³²

The problem of local competition was solved by the formation of a private limited company, the Water of Ayr and Tam O'Shanter Hone Works Limited, registered at Edinburgh on 2 October 1900.³³ The main object of the company was:—

'To purchase or otherwise acquire the business of Hone Manufacturer, Quarrier and Merchant carried on by John Cuninghame Montgomerie of Dalmore in the parish of Stair in the county of Ayr, at Dalmore, Ayrshire, and the business of Hone Manufacturers, Quarriers and Merchants carried on by the firm of G. McPherson Junior and Company, at Meikledale in the parish of Stair, and Enterkine in the parish of Tarbolton, Ayrshire, and in Glasgow, together with the goodwill and the whole property . . . of the respective businesses.'

The subscribers, all with one share, were

John C. Montgomerie, Dalmore, Stair, Hone Manufacturer.

Gilbert McPherson Jr., Campbeltown, Coalmaster.

James A. Donald, Glasgow, Hone Manufacturer.

Jessie H.C. Montgomerie, Dalmore, wife of J.C.M.

J.H.V.D. Montgomerie, Dalmore, spinster.

John C. Montgomerie, Jr., Dalmore, student.

W.D. Montgomerie, Dalmore, student.

John C. Montgomerie was Managing Director, but McPherson and Donald were also Directors.

The nominal capital was £7,135 in shares of £1. Of 5135 shares allocated for the purchase of the businesses, approximately 10% were held by McPherson, 10% by Donald, and 80% by Montgomerie. It seems Montgomerie had gained control of his former competitors.

Donald died in 1926, McPherson not until much later. On Donald's death, J.C. Montgomerie Junior purchased the firm of Donald and McPherson, which continued to sell abrasives until the 1950s.

Over the years there have been, of course, changes in the lists of directors and shareholders, but there are still three of the former and seven of the latter, now all members of the Montgomerie family. Mr. Kenneth B.C. Montgomerie acts as Managing Director and Secretary of the company; he is a grandson of the founder.

3. Size of the hone-stone operation.

We have already mentioned that the 'New Statistical Account of Scotland' stated that only two men were employed in 1841. In 1858 'Mineral Statistics' showed an 'average annual produce' of 60 tons valued at £17 per ton at the quarry; presumably this means the value before processing into hones. This is a surprisingly high value, seeing that Pettigrew's advertisement of 1850 shows the finished hones as worth £20-£30 per ton. At any rate, the annual turnover of the enterprise was in the range £1000-£2000.

No more figures are available until entries of Honestone started again in 'Mineral Statistics' in 1888.³⁴ The only entry for British production was for Ayrshire, so this must have been Water of Ayr stone. The entry was in the section 'Stone from Mines under the Metaliferous Mines Act', so it is clear that the main operation was mining and not quarrying by 1888. Figures were:—

1888: 263 tons	1891: 281 tons	1894: 345 tons
1889: 256 tons	1892: 341 tons	1895: 349 tons ³⁵
1890: 279 tons	1893: 336 tons	1896: 340 tons

After 1896 these returns were no longer given in 'Mineral Statistics', but in that year a new series of returns was started in the 'Inspectors' Reports'.³⁶ Ayrshire was shown as having two mines under the Metaliferous Mines Act, and the only product was Hone Stone, so the figures must refer to the Water of Ayr production. It is not quite clear why two mines were shown; it is believed that Dalmore was the only true mine at that time, but it is possible that one of the quarries had a certain element of mining in its operation. In addition to tonnage, the number of employees was given under three categories:—

- A. males below ground,
- B. males above ground,
- C. females above ground.

The figures are set out in Table 2.

TABLE 2
OUTPUT AND NUMBER OF EMPLOYEES AT
WATER OF AYR HONE-STONE MINES

YEAR	TONS	NO. OF EMPLOYEES		
		A	B	C
1896	340	8	9	2
1897	311	6	10	2
1898	273	8	10	2
1899	251	14	10	2
1900	303	7	11	2
1901	340	9	6	0
1902	328	7	11	2
1903	406	7	11	3
1904	114	7	11	3
1905	120	7	11	3
1906	145	7	11	3
1907	131	7	11	3
1908	118 (a)	6	11	3
1909	126	6	11	3
1910	145	6	11	3
1911	210	6	4	0

1912	230		(b)	
1913	164	7	16 (c)	3
1914	119	6	15	2

Note (a) Plus 101 tons of graphite

Note (b) 1912 figures omitted here as a limestone works was included.

Note (c) Figures for 1913-14 doubtful, as limestone works may have been included.

The works employed 13 people in 1923,³⁷ and employ 10 at the time of writing (April 1982).

There are some peculiarities in the figures in the table, in particular the abrupt fall in tonnage in 1903-04. Since this was not associated with any change in the number of employees, it was probably due to a change in the bases of reckoning, e.g. from total amount of rock excavated to useful amount actually taken to the processing mills. The proportion of waste is at the present day around 80%, so this is a quite-likely explanation. On the other hand, the association of the exceptionally-large number of employees in 1899 with a fall in production is not so easily explained.

The mention of the production of 101 tons of graphite in 1908 deserves some discussion. The existence of a quarry of 'black lead' (i.e. graphite) near the hone-stone quarry was noted as early as 1791;³⁸ it was worked between 1808 and 1815;³⁹ and William Heron erected a mill to pulverise the graphite at some time between 1815 and 1830, although he did not proceed with commercial production.⁴⁰ From the data in the table, the production of graphite appears to be a 'one-off' occurrence; it was apparently done without extra labour, which may account for the rather low production of hone-stone that year. By 1930, nothing was to be seen of the deposit,⁴¹ which had evidently been worked out.

4. The range of products.

For a century at least, and probably since the beginning of the production of hones at Stair, there has been a very

wide range of sizes and shapes of the finished product. This corresponds to the wide range of applications from the polishing and sharpening of small watch and clock parts, jewellery, and the tools used in those trades, to the sharpening of large edge tools such as carriers' knives; but it also suits the nature of the natural stone itself, which is quarried or mined in blocks of variable but generally small size and irregular shape, making it convenient to cut a relatively small number of large hones and a large number of small ones.

To avoid excessive verbal description, the products included in a catalogue,⁴² issued in about 1915, are summarised in Appendix 2. This should be reasonably self-explanatory. The cover of this catalogue is reproduced in Fig. 3. The prices of those items which also appeared in a price list⁴³ of 1885 show little change over 30 years — just a few small increases here and there. The catalogue of c.1915 does not, however, include all the products made; in particular it does not include octagonal Carriers' Clearing Stones (i.e. the 'square with the corners taken off' referred to in Section 1 of Part 1). As these stones are still made at the present day (and are to be seen in the photograph in Fig. 12 taken in the works in 1982), and were shown in the 1885 list (35s.0d. to 45s.0d. per cwt. according to size), it must be presumed they were also available in 1915. The 'small' size of these stones was in the range 3 to 6 in. across the face by 1½ to 3 in. thick, the 'medium' size 6 to 7 in. face by 1½ to 4 in. thick, and the 'large' size 7 to 9 in. face by 1½ to 4 in. thick. It is curious also that hones for sharpening medical instruments are not included in the catalogue of c.1915, nor hones for the watch and clock and jewellery trades. The latter were not shown in the list of 1885 either. Perhaps separate catalogues were issued for these. Certainly many hones much smaller than those shown were, and are still, made. A hone in the possession of Mr. W. Melville which can be dated to the late 1880s is 6 by ½ by ½ in., with the label showing the wording in Fig. 4. A hone purchased in Oxford in 1977 is 4.9 in. long and of triangular cross-section with sides 0.4, 0.4, and 0.35 in., and its label has the wording in Fig. 5. Mr. Kenneth Montgomerie said the triangular section, as also a circular section, is rare and only made to special order.

FIG. 3

Cover of Catalogue of about 1915.
Although the firm operated at Stair in Ayrshire,
it had, at that time, an office in Glasgow.



FIG. 4

Lettering on red label, $1\frac{1}{2}$ by $\frac{3}{4}$ inch,
folded over end of hone, dating probably from
1885-1889 as the award of 1890 is not mentioned.

CELEBRATED TAM O'SHANTER STONE
formerly known as Water of Ayr Stone, Snake
Stone or Scotch Hone.

These names are now ABANDONED for the
stone esteemed as such for about 100 years
past because inferior stone was sold under
these names which are not protectable by law
as trade names. The Mercantile Marks Act
makes it an offence to remove trade marks . . .
Gold Medal, London 1885, for excellence of
quality of stone. Infringement will be prose-
cuted. JOHN C. MONTGOMERIE.

FIG. 5

Lettering on red label, 1.8 by 0.85 inch,
folded over end of triangular hone
purchased in 1977.

MADE IN SCOTLAND
TRADE THE CELEBRATED SCOTCH MARK
"TAM O'SHANTER" HONE

Used by the most eminent firms of Watch and
Clock Manufacturers, Lithographers, &c., &c.
The Merchandise Marks Act makes it an
offence to remove Trade Labels, &c. Infringe-
ments will be prosecuted.

Gold Medals, London 1885 and 1890 for
excellence and quality of stone.

*The Water of Ayr & Tam O'Shanter Hone
Works, Ltd.*

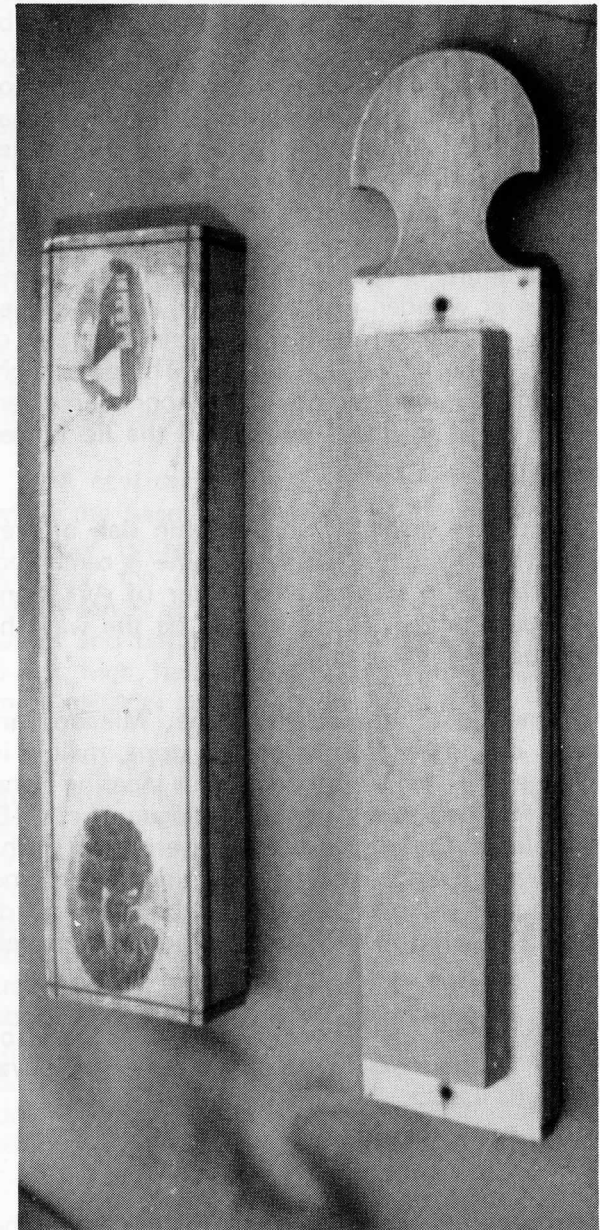


FIG. 6

Mounted and cased hone with decoration including views of the "Land o' Burns".

Nowadays, wooden cases and wooden mounts for hones are not supplied, but for a period of about a century they were in much demand. The cases and mounts were made by the firm of Smiths at Mauchline, who were renowned for their fine wooden ware, in particular snuff boxes. Hardwood cases, polished and varnished, were appreciably cheaper than whitewood cases which were not only polished and varnished but also decorated with black lines round the edges, and in many instances with pictures — 'Views from the "Land o' Burns"' (as in Fig. 6) — which reminded the purchaser that the area was even more famous for its poet, Robert Burns, than for its hones or wooden ware. The flat, or slab-shaped hone was glued to the base of the box, and the upper part or lid could lift off, or be hinged at one end. The base might have a handle to suit the intended use of the hone. Some pen-knife hones were fitted in boxes which had the lid hinged along its long side.

Double stones are made in which a thin slab of grey Tam O'Shanter stone from the Dalmore mine is cemented, back-to-back, with a thin slab of blue Water of Ayr stone from the Meikledale mine. (This seems to be the way the names have been used for some time.)

Coarser stones with the trade name 'Mikado' are supplied in small quantities from a yellow stone, mainly in the form of Gouge Slips, which are small slabs tapering transversely and with rounded edges. In the catalogue of c.1915, hones of rectangular section of various sizes were listed as the Mikado Oil and Water Stone, 'a very fast cutting Joiners' and Engineers' Whetstone', and offered at prices about two-thirds of those of Tam O'Shanter or Water of Ayr hones of corresponding sizes.

It was usually stated that Tam O'Shanter or Water of Ayr hones would 'sharpen best if used with water or saliva, but a thin oil may be used . . . '.

5. The mines.

The hone-stone was originally found in the bed of the river; later the vein was obtained south of the river, from a

quarry about 40 ft. deep in the mid-19th century. Further extension was then by mining, forming the Dalmore mine which is still the main basis of the works. The original shaft, dating from the 1870s, is still used for emergency egress and for ventilation; it is about 120 ft. deep and fitted with ladders and staging. Pumping has always been necessary, and until about 1938 was done by a beam engine (now unfortunately completely removed) which had a 20 ft. beam. Winding was done by a separate steam engine but both engines were fed from the same Lancashire boiler. The old cast-iron winding drums and gears still lie abandoned in the grounds, as shown in the photograph in Fig. 7. To comply with the legal requirements of the time, the beam-engine and winding gear were screened from the nearby road by a wooden paling 10 ft. high to prevent passing horses from taking fright.

A new shaft to the north of the original one was sunk when the beam engine was abandoned. It has a steel-girder headgear (shown in the photograph of Fig. 8) and electric winding, the drive and drums being in the wooden shed which serves as a mine control room, with racks of helmets, lamps and battery boxes. The cage, about 4 ft. square and 6-7 ft. high, has rails on its floor to connect with those in the mine galleries so that it can take a tram wagon, or 'hutch'.

The normal way in and out for the miners is a sloping shaft with steps, opening in the hillside below the winding shaft. When no-one is working in the mine, this opening is protected by wooden doors which can be locked. With three shafts normally open, ventilation in the galleries is good. The galleries are numerous and extensive, the mine extending about 800 yards southward from the shafts. All galleries have tram rails of 20 in. gauge on timber sleepers, and there are about two dozen trams (hutches) with wooden bodies made in the firm's workshop. Excavation and haulage is by man power. Pumping is now done by a three-crank ram pump, driven by belt from an electric motor at the bottom level of the mine. There is also a stand-by electric pumping set.

All the gallery roofs are supported by timber props, vertical and horizontal, for the stone is loose with bands of

'dirt'. It is difficult to get good blocks, say of 1 ft. cube, for making the larger hones. Much of the material has intrusions (some being circular, giving the appearance of bull's eyes) which, while making rock pretty to look at, makes it useless for hones. As far as possible the waste rock is back-filled into dead galleries; what has to be tipped is tipped down the walls of the old quarry, so that no exposed quarry faces are now to be seen. Some of the galleries are 6 or 7 ft. high, making walking through them easy; others are in places no more than about 4 ft. 6 in.; the width is variable too, being generally about 6 ft. One side gallery has an apparent slope because of a roof fall, but there are some genuine sloping galleries, and hutches were got down these by using self-acting inclines called 'cuddie braes', temporarily installed. In a suitable recess in the mine is stored the equipment: a winding pulley on a shaft about 6 ft. long which can when required be wedged vertically between suitable timbers, and a counter-weight open-frame wagon which can be loaded with the right amount of waste stone.

At one point in the mine there was an old piece of drilling equipment; effectively a screw jack which took a drill bar into a sort of chuck at one end, the other end having a spike which would hold in a beam of wood against which the jack could press to force the drill into the rock. This is possible because to be good hone-stone, the rock is not very hard.

The electric power for the mine is generated by the firm's own water-turbine plant on the north bank of the river.

There used to be a tramway all the way from the mine to the mill, of 20 in. gauge to match the rails in the mine, worked by horses. It was taken up about 1945. After that, a horse and cart was used; now a lorry.

The Meikledale mine is only about 40 ft. deep, running fairly level into a hillside; it is not very extensive, and is self-draining through the adit. In its early days, water was pumped up one of the shafts using a wind-engine with galvanised-iron sails or blades and a pylon-type tower. This shaft is now filled in. The other shaft is still used for winding.



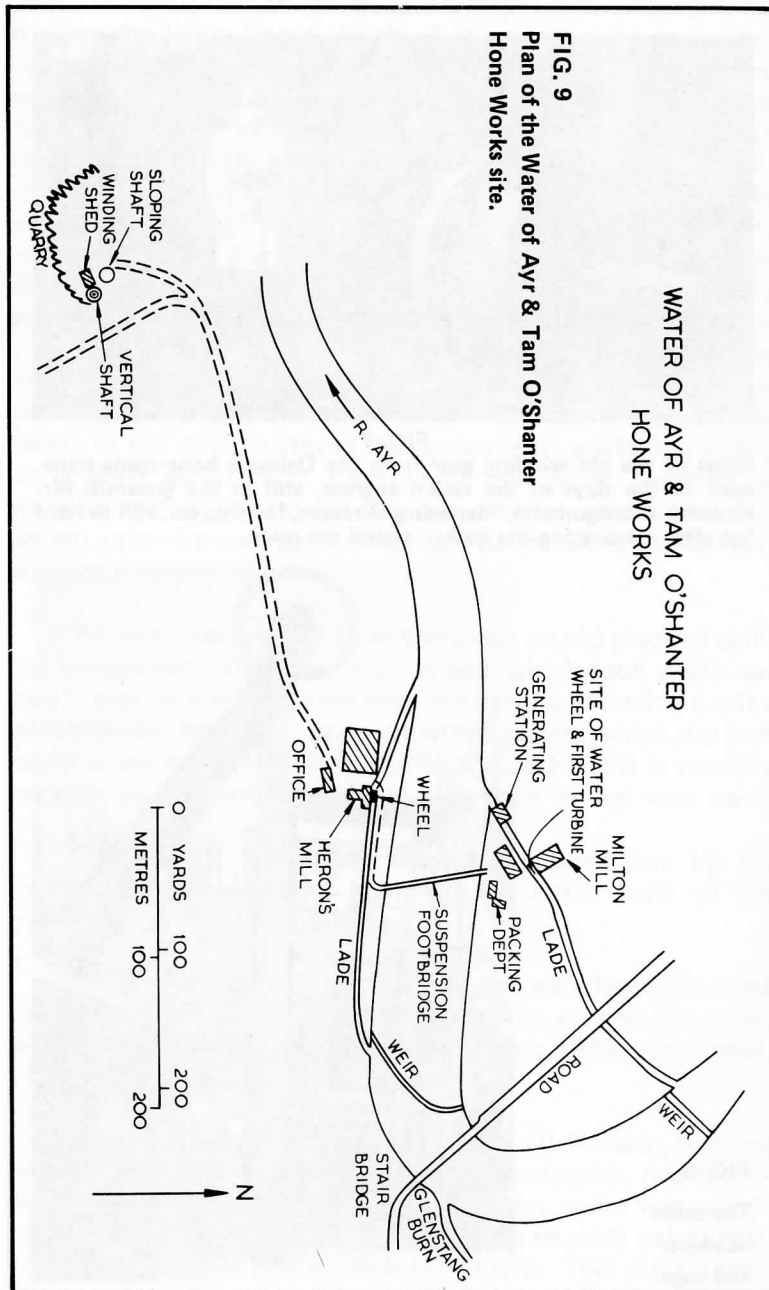
FIG. 7

Some of the old winding gear from the Dalmore hone-stone mine, used in the days of the steam engines, still in the grounds; Mr. Kenneth Montgomerie, Managing Director, looking on, still in hard hat after conducting the author round the mine.



FIG. 8

The mine headgear and cage.



6. The works.

The relationship of the building of the works to the mine and to Stair Bridge is shown in the plan of Fig. 9.⁴⁴ Two weirs once provided water power for two corn mills, one on the north (Milton Mill) and one on the south (Heron's Mill). Both mills still exist as buildings, more-or-less intact. At Heron's Mill the axle, boss and wooden arms of a large water wheel remain in situ on the north face of the mill as shown in the plan. It was probably a low-breast wheel. The original function of the mill is indicated by a carved stone sheaf of wheat, full size, in bas-relief on the western wall of the southern wing, with the lettering

W. HERON
1821

cut in its base. In the angle of the walls below this is an external stone staircase, still used as the main access to the working floor.

Milton Mill is now used as storage space, and the 15 ft. head of water is used to drive a 58 kW Kaplan variable-pitch turbine (made by Boving and installed in about 1935) coupled to a D.C. generator to supply electric power to the mine. A governor controls the pitch of the blades to match the load. The machinery is housed in a separate small building as shown in the plan. However, from about 1900 to 1935, electricity was generated at Milton Mill itself, an earlier turbine replacing the water wheel there. From 1935 until 1964, the water-generated electricity also drove the electric motors in the works; but in 1964 a flood wrecked the motors and it was decided to supply the works thereafter from the mains.

The Milton Mill site was where Brown and then McPherson cut and polished their stone, using the power from the mill-wheel as required. Heron's Mill was used by Montgomerie similarly. Since the integration of the firms, both sides have continued in use, Heron's Mill now being used for the cutting of the blocks for the hones, using

diamond-fitted circular saws, and the northern site being used mainly for the facing, turning and polishing of the hones. All machinery is now driven by mains electricity.

The sawing of the blocks at the southern mill is done under water jets and there is no dust problem. (see Fig. 10) Some sawing, mainly of large blocks, is also done at the northern site, but this is done dry, and a dust-extractor hood is used. Polishing is done on a large horizontal rotating 'polishing plate' on which fine sand and water are fed, and the hone is held by hand against this until suitably smoothed. (see Fig. 11) Large hones (see Fig. 12) are faced and turned on a lathe, without water (see Fig. 13); a dust extractor is fitted. The plant is probably little different in general principle to what was used a century or more ago. Electric power is more flexible than water power, and diamond saws are undoubtedly faster than plain steel saws, but the processes are still entirely hand-controlled, and demand considerable skill.

Packing for despatch is done on the northern site. We saw several large metal drums filled with hones ready to go to Bucharest. Another consignment was for Australia.

It is a great shame that vandalism is a problem at the works. Stair Bridge and the area immediately to the east (Bridge End, where the inn is) is a very beautiful place, but is, of course, only an oasis in a dominantly-industrial area, formerly very busy with coal mining. Great damage is done by the vandals and all windows have to be shuttered when not permanently bricked or boarded up. At the mine, the lock on the doors of the sloping shaft was once shot away; trees on the river bank have been sawn down and allowed to fall in the river; damage is quite indiscriminate.

It is a matter for satisfaction, however, that the works have kept going at a stable level of activity for so long, and it is much to be hoped that they can survive the present difficult period.

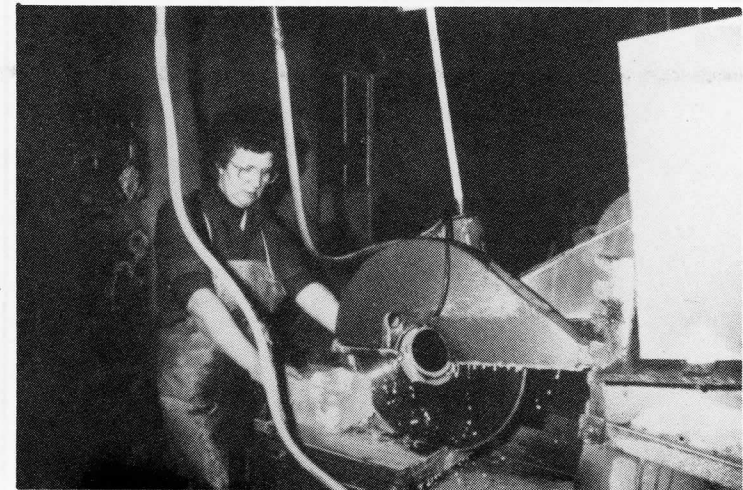


FIG. 10

One of the employees (Mrs. Graham) cutting a block from the mine into hone sticks with a diamond saw under water jets.

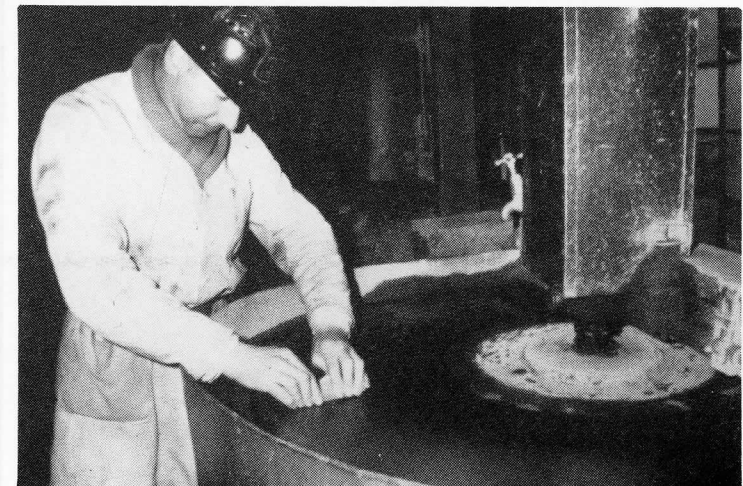


FIG. 11

Mr. Montgomerie demonstrating the polishing of a small hone on the rotating polishing plate, using sand and water.



FIG. 12
Stacks of large circular and octagonal hones.



FIG. 13
Large block being faced on the lathe.

ACKNOWLEDGEMENTS

Many people have helped in this study. First of all I must express my thanks to Mr. K.B.C. Montgomerie for showing me the mine and works of the Water of Ayr and Tam O'Shanter Hone Works Ltd. and for giving me much valuable technical and historical information; also to his cousin Mrs. Jessie Montgomerie Wright (another director of the firm) for arranging further discussions at her home in Chipping Campden. Then thanks to Mr. W. Melville of Birmingham for helpful information about Water of Ayr hones, to Mr. S.D. Coates of Monmouth for presenting me with a sample, to Mr. D.E. Bick of Newent for references to Devonshire scythe-stones, to Mr. R.T. Doncaster of Sheffield for a reference to Derbyshire scythe-stones, to Mr. J.H. Norris of Wilmslow for a reference to Welsh hones, and to Mr. Roy Thomson of Northampton for information about curriers' tools. Finally, I must acknowledge the use I have made of the facilities of the Public Record Office, the Scottish Companies Registration Office, and the libraries of the University of Birmingham (Geology and Geography Departments as well as the main library) and the City of Birmingham.

REFERENCES

1. ALEXANDER WATT, 'The Art of Leather Manufacture', Crosby Lockwood, London, 1885, p.336.
2. M.C. LAMB, 'Leather Dressing', Leather Trades Pub.Co., London, 1903, pp.30-33.
3. R. KNIGHT, 'Hone-stones, &c', *Trans.Soc.Arts.* 50, 1836, pp. 231-7.
4. E.g. CHARLES TOMLINSON, 'Cyclopaedia', 1854; Chambers's Encyclopaedia, 1880, Vol. 5; *ibid*, 1927, Vol. 10, article on 'Whetstones'.
5. Above information from *Mines and Quarries*, H.M.S.O., 1900, Part 4, p.374.
6. Copy of Catalogue in Company's office at Stair.
7. Wm. WHITE, 'History, Gazetteer & Directory of the Counties of Leicester and Rutland', Sheffield and London, 1863, p. 478.
8. *Ibid*, p. 81.
9. R. HUNT, 'Mineral Statistics', 1858.
10. I.E. DAVIES, 'The mills of stone are silent', *Country Quest*, Feb. 1966, pp. 5-6, and 'The manufacture of hone-stones in Gwynedd', *Trans. Caerns. Hist. Soc.*, 37, 1976, pp. 80-86.
11. D. ROBERTS, 'Some producers of hone-stones in Wales', *Industrial Past*, Spring 1982, pp. 2-5 plus 3 plates.
12. W.H. FITTON, 'Observations on some of the strata . . .', *Trans. Geological Soc. London*, 2nd series 4, 1836, pp. 235-8.
13. J. STEEL, 'Parish of Stair, Ayrshire', in 'Statistical Account of Scotland', ed. Sir John Sinclair, vol.vi, Edinburgh, 1791-99.
14. M. MacGREGOR, 'Synopsis of the Mineral Resources of Scotland', H.M.S.O., Edinburgh, 1940, p. 49.
15. W. RORISON, 'Parish of Stair', in 'New Statistical Account of Scotland', vol. 5, Edinburgh, 1845.

16. Companies Registration Office, Edinburgh; ref. SC4634. William Aiton, *General View of the Agriculture of the County of Ayr*, 1811, p. 53, may be referring to this site when he wrote: 'Hones, or whetstones of an excellent quality, are found at Gadgirth, and many thousands of them are dug up and sold.'
17. RORISON, loc.cit.
18. V.A. EYLES, J.B. SIMPSON and A.G. MacGREGOR, 'The Economic Geology of the Ayrshire Coalfields, Area III', H.M.S.O. Edinburgh, 1930, p. 160.
19. J.R. McCULLOCH, 'Statistical Account of the British Empire', 1839, Vol. 1, p. 279; see also Chambers's Encyclopaedia, 1891 under MAUCHLINE.
20. RORISON, loc.cit.
21. A. REES, 'Cyclopaedia', 1819, Vols. 17 and 38 respectively.
22. *London J. of Arts & Sciences*, 1, 1832, p. 39.
23. R. KNIGHT, 'Hone-stones, &c.', *Trans. Soc. Arts*, 50, 1836, pp. 231-7.
24. C. TOMLINSON, 'Cyclopaedia', 1854; 'Encycl. Britan.', 8th ed., 1856, Vol. 11.
25. R. HUNT, 'Mineral Statistics', H.M.S.O., London, 1858, pp. 282-3.
26. P.R.O., CUST 8/49 and 50.
27. Mrs. Jessie Montgomerie Wright has a copy of the inscription in an old family album.
28. *Ayr Advertiser*, 23 Jan. 1851.
29. Ibid, 18 July 1850.
30. Ibid, 17 Oct. 1850.
31. This and much of the rest of the information in this and the next paragraph is based on 'Slater's Directory of Scotland' for the years indicated.
32. Copy in the possession of Mr. Kenneth Montgomerie.

33. No. SC4634.
34. *Mineral Statistics*, H.M.S.O., London, annually.
35. For 1895 the compiler of the returns appears to have got muddled; the honestone figure comes under both 'Slate and Slate Slabs from Mines' and under 'Quarries'.
36. *Reports of Inspectors of Mines* H.M.S.O., London, annually.
37. *List of Mines*, 1923, H.M.S.O. London, p. 54.
38. J. STEEL, loc.cit.
39. EYLES, SIMPSON and MacGREGOR, op.cit., p. 11.
40. RORISON, loc.cit. F.H. Groome, *Ordnance Gazetteer of Scotland*, Vol. VI, 1886, article on 'Stair' may be in error in stating that 'plumbago or black-lead was worked between 1830 and 1850'.
41. EYLES, SIMPSON and MacGREGOR, op.cit., p. 163.
42. Copy in the Company's Office at Stair.
43. Attached to a circular letter to customers from John C. Montgomerie dated Jan. 1885; copy in Company's Office at Stair.
44. For the buildings and their history see John Hume, 'Mills of the River Ayr', *Ayrshire Collections*, Vol 8, 1969, pages 49 and 50.

APPENDIX 1

SOME SOURCES OF SCYTHE-STONES

DEVON

Western slopes of Blackdown Hills, particularly parishes of Kentisbeare, Broadhembury and Payhembury. Scythe-stones made from indurated concretions of greensand; local name *Devonshire Batts* used over Southern England; early 19th century, 8d. to 2s. per dozen.

- (1) H.T. de la Beche, 'Geology of Cornwall, Devon and West Somerset', London, 1839, pp. 516-7.
- (2) D. & S. Lysons, 'Magna Britannia', Vol. 6, 'Devon' 1822, p. 294.
- (3) W.H. Fitton, *Trans. Geol. Soc. London*, 2nd series, 1836, pp. 235-8.

WILTSHIRE

Stower Head Quarry, 3 miles NW of Mere. (Portland Stone).

- (4) R. Hunt, 'Mineral Statistics', 1858 (who shows it as in Dorset; it is near boundary of Dorset and Somerset.)

SHROPSHIRE

Ludlow Quarry. (New red sandstone). Scythe-stones sold as 'Waterloo Scythe Stones'.

- (5) R. Hunt, 'Mineral Statistics', 1858.

DENBIGHSHIRE

Cefn Quarries, 4 miles E of Langollen (Chatham Brothers 1937)

- (6) Directory of Quarries, 1937.

FLINTSHIRE

Talacre Quarry, 2 miles E of Prestatyn. (Thos. Williams 1937).

- (7) R. Hunt, 'Mineral Statistics', 1858 (shows grit stone).
- (8) Directory of Quarries, 1937.
- (9) T.T. Pennant Williams et.al., 'The Talacre scythe stone quarries', *Proc. Dyserth & Dist. Field Club*, 1957, pp. 48-53.

LANCASHIRE

Billinge Hill Quarry, 5 miles SW of Wigan (Thos. Tasker in 1858). The Upholland flags, used for grinding stones and scythe-stones, 'are quarried both in open work and by shafts for a distance of 10 miles from north to south, along a ridge of high ground'.

- (10) R. Hunt, 'Mineral Statistics', 1858.

YORKSHIRE

- 1. Harthill Quarry, 10 miles SW of Sheffield. (Sandstone).
- (11) R. Hunt, 'Mineral Statistics', 1858.
- 2. Darfield Quarries, just S of Barnsley. (Stephen Seal, Son & Co., 1937).
- (12) Directory of Quarries, 1937.
- 3. Ackworth Moor Top Quarry, 3 miles S of Pontefract. (Samuel Seal & Sons, Ltd., 1937).
- (13) Directory of Quarries, 1937.
- (14) Photograph of mason's yard showing scythe-stones in Geological Survey Museum (ref. A7047); listed in M.O. Morris, 'Classified Geological Photographs from collections of the Geological Survey and Museum', H.M.S.O., 1952.

DERBYSHIRE

As with millstone-making, the making of scythe-stones was so widespread over northern Derbyshire that it is hard to compile a definitive list of sites. References to the industry from 1672 and 1692, indicating a wide dispersal of the product to 'all parts of the Kingdom', are given by Hey. Farey lists a dozen places where scythe-stones were made at the beginning of the 19th century. Plant describes the archaeological indications of a former scythe-stone industry on Beeley Moor, about 5 miles north of Matlock.

- (15) D. Hey, 'Packmen, Carriers and Packhorse Roads', Leicester, 1980, p. 141.
- (16) J. Farey, 'A General View of the Agriculture of Derbyshire', 1811, Vol. 1, p. 438.
- (17) M. Plant, 'A scythe-stone industry on Beeley Moor', *Derbyshire Archaeol. J.*, 88, 1968, pp. 98-100.

APPENDIX 2

WATER OF AYR AND TAM O'SHANTER HONES AVAILABLE c.1915

1. UNCASHED HONES, rectangular slabs.

- (a) Joiners' and Carpenters' Hones, supplied in random sizes within stated ranges:—

7 to 9 x 1¼ to 2 x ¾ to 1¼ inch	} 30 shillings per cwt.
7 to 8 or 8 to 9 x 1¼ to 2 x ¾ to 1 inch	
5 to 6 or 6 to 7 x 1¼ to 2 x ¾ to 1 inch	

If required, supplied to exact size except for thickness in range ¾ to 1 inch; prices now per dozen hones:—

5 x 2 inch, 4s.0d.; 6 x 2, 4s.6d.; 7 x 2, 5s.6d.; 8 x 2, 6s.6d.; 9 x 2, 8s.6d.

- (b) Razor Hones, exact length, price per dozen:—

6 inch, 4s.6d.; 7 inch, 5s.6d.; 8 inch, 6s.6d.; 9 inch, 8s.6d.; 10 inch 12s.0d.

- (c) Penknife Hones, with Easel Racks, 6 x 1½ x ½ inch, 6 in pasteboard box, 3s.9d. per dozen; or 5 x ¾ x ½ inch, 12 in box, 1s.9d. per dozen.

- (d) Penknife Hones, Axe and Hedge Knife Hones, and Sheep Shear Hones, covering the various ranges of size in (a) and (c), all 30s.0d per cwt. Penknife Hones in exact size except for thickness:—

5 x 1 x ½ to ¾ inch, 2s.3d.; up to 8 x 1¾ x ¾ to 1 inch, 6s.0d. per dozen.

- (e) Axe Bit Hones, in range 2½ to 3½ x 1¼ to 1½ x ¾ to ⅝ inch, or 3 to 4½ x 1¾ to 1⅝ x ½ to ¾ inch, 26s.0d. per cwt.

If cut to specified size, 28s.0d. per cwt.

2. HONES IN WOODEN CASES, rectangular slabs.

- (a) Tam O'Shanter Carpenters' and Joiners' Hones in Hardwood cases, 6 inch long, 12s.6d. per dozen; up to 9 inch long, 18s.0d. per dozen.

- (b) Ditto, in whitewood cases, 7 inch long, 17s.0d. per dozen; 8 inch, 19s.6d.

- (c) Tam O'Shanter Razor and Penknife Hones in hardwood cases, 5½, 6½ or 7½ inch long, 11s.0d. to 16s.0d. to 16s.0d. per dozen.

- (d) Ditto, in whitewood cases, with or without views of "Land o'Burns", 5½, 6½ or 7½ inch long, 13s.0d. to 18s.0d. per dozen.

- (e) Penknife and Desk Hones, mounted or boxed, various styles and sizes, prices ranging from 4s.3d. to 11s.0d. per dozen.

3. UNCASHED HONES, non-rectangular cross-section.

- (a) Round Edge Bevelled Gouge Slips, in random sizes within stated range:—

4 to 5 inch long x 1¼ to 2 inch broad; back ⅜ to ¾ inch; edge ⅜ to ⅝ inch; 3s.0d. per dozen.

- (b) Moulding Plane Hones, one round and one square edge, 5 to 6 x 1¾ to 2 x ⅝ to ½ inch; 3s.0d. per dozen.

- (c) Rubber-Tapping-Knife Hones, 3s.0d. per dozen.

- (d) Pruning Secateurs and Gardeners' pocket Hones, oval cross-section. Former, size not stated, 3s.6d. per dozen.

Latter, 3 to 4½ x 1¼ to 1½ x ¾ to ¾ inch, 1s.9d. per dozen.

- (e) Carving-Tool Slips, any size or shape made, set of 4 pieces, 1s.0d.

4. CIRCULAR HONES

Various sizes and degrees of fineness supplied, also segments for discs. 3 to 8 inch diam., ¾ to 1 inch thick, 3d. per inch diameter. Over 8 inch diam., also segments, 1s.0d. per lb.

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