

III

MILLSTONES AND MILLSTONE QUARRIES IN NORTHUMBERLAND

George Jobey

“Echo in her airy round
O'er the river, rock and hill
Cannot catch a single sound
Save the clack of yonder mill”

IN THE mid-eighteenth century when a local poet, John Cunningham, wrote this simple pastoral quatrain, the swirling waterwheel, the straining sails or the tell-tale clack of the corn mill were commonplace to rural and urban dwellers alike. And so it had been since medieval times when the mill, as often the most valuable piece of capital equipment on the manor, had its economic return largely safeguarded by thirlage and customary services. In like manner, the common millstone, clumsy maybe, but as Ruskin saw it “the first cause and motive of all the fabric”, had been in constant and generally increasing demand over the centuries. By the mid-nineteenth century, however, the old-style milling industry, marked by its proliferation of smaller mills, was already in process of change. Furthermore, despite a continuous increase in the population, the British milling industry in the second half of the nineteenth century was facing a considerable depression, partly because of the large imports of cheap and more popular American roller-milled flour. Such competition, together with the long delayed but inevitable introduction of the roller-mill into Britain in the later 1870s, not only posed a threat to the survival of the old-fashioned system but also led to a considerable reduction in the demand for millstones, whether these were of indigenous or continental origin.

Although the history of the local corn-milling industry is not our primary concern at this juncture, a few illustrations may serve to indicate the general changes which occurred. In some of the less fertile parts of Northumberland the decline in the number of small mills of the upland system, where tenancy of the mill was generally combined with that of a small-holding or farm, had taken place at a comparatively early date and for reasons which were seemingly local rather than national. For example, during the first half of the seventeenth century there had been at least eleven operative corn mills in the remote valley of the Rede, bounded by the high moorlands of Elsdon and Corsenside, but by 1825 the number had already fallen to a single mill in the village of Elsdon. This almost total demise was attributed at

the time to a local decline in cereal growing in the face of competition from the richer corn lands to the north of the Border.¹ Elsewhere, a reduction in the number of rural mills occurred somewhat later and for reasons more closely related to those which were leading to the countrywide changes in the milling industry. By the end of the nineteenth century, for instance, we find the local historian of the more fertile Vale of Whittingham and Coquetdale commenting not only on a similar radical reduction in the number of local corn mills, but also on the consequent disappearance of the numerous "grinders" and "pokers" from amongst the population of the dales, together with the replacement of the locally ground "batches" by supplies obtained from the larger flour dealers.²

Around Newcastle itself corn mills had continued to grow in number both before and during the eighteenth century and by *c.* 1745, for example, there were eighteen windmills alone listed within two miles of the town, whilst at least eight windmills are visible in or on the verges of the town in the contemporary illustration *Prospect of Newcastle from the South-East*.³ An unusual but perhaps telling illustration of such economic potential later in the same century may be seen in an advertisement of 1782, in which the then lessee of the Castle, with notable entrepreneurial vision but little regard for the heritage or the skyline, offered it for letting as "an advantageous site upon which to erect a windmill for the purpose of grinding corn".⁴ It may be noted in passing that similar business acumen, perhaps prompted by the idea of an economic corner on both cakes and ale, also allowed him to describe this future home of the Society as an eligible place for a brewery. By the early nineteenth century, however, at least the traditional forms of motive power for local mills were beginning to face competition from the introduction of steam. The first steam-powered corn mill on Tyneside was opened at Willington Gut below Newcastle in 1806,⁵ and in the same year, at the other end of the county, a new steam mill in Tweedmouth, driving three pairs of stones with a 12 h.p. engine, could be described as "one of the greatest curiosities ever we had in this place" such as "neither light winds nor scarcity of water would stop in its progress".⁶ In 1827, by when the actual number of corn mills around Newcastle had possibly reached a peak, Mackenzie wrote of there being 49 windmills, 12 watermills and 18 steam-powered mills in and around Newcastle, mainly for grinding corn.⁷ The fairly rapid incursion of steam, more particularly at the expense of wind-power, was thus already evident. Perhaps not surprisingly, by a decade later, it proved impossible to let the brick-built windmill known as the Borough mill Gateshead, which although fully equipped and in good working order was subsequently dismantled.⁸ And by the 1880's only one windmill remained operative in Newcastle itself, namely that which was originally designed by John Smeaton at Chimney Mills overlooking the Town Moor.⁹

It is relevant to note, however, that whilst steam-power contributed substantially to the demise of the old-style industry, by eventually allowing a greater and more assured production from larger mills, it did not in itself reduce the long-lived demand for the traditional millstone. There is probably no better illustration of this than that provided by Tod's mill in Leith, probably the largest between Tyne and Forth

in the 1860s, where as many as 36 pairs of millstones as well as ancillary equipment were being driven by a single steam engine of 350 h.p., the whole being capable of converting corn into flour at the rate of 500 sacks every 24 hours.¹⁰ On the contrary, the more immediate threat to the use of the ordinary millstone came from the belated introduction of mill rollers of iron, steel and porcelain, as already intimated, and to a minor extent by the use of composition stones. By 1884 and, as it happens, only a short while before one Joseph Rank opened his first roller mill at Hull, James Clephan could make the following observation in an address to this Society—"steam wrestles with wind and water and millstones have their rivals in the mill rollers that fashion the corn of modern harvests."¹¹ The rival methods did of course continue to exist side by side, and some water-powered mills in Northumberland continued to operate with millstones into the present century, such as Thrum mill near Rothbury, Felton Park mill before its conversion to rollers, and Heatherslaw mill, as it is now known, on the Till.¹² Moreover, both methods of processing could also be found in the same building, as in the refurbished steam-powered East mill at Morpeth, still proudly emblazoned with its exterior legend "NEW PROCESS FLOUR MILL 1892",¹³ whilst the renowned stone-milled wholemeal from the large Gallowgate Steam Mills of John Hindhaugh will be familiar enough to some members of the Society. But essentially the hey-day of the traditional millstone was over by the last two decades of the nineteenth century, and in the Transactions of this Society Clephan's passing reference to them has remained a valediction on the subject for precisely a century.

Before examining the part played by local resources in meeting a long-lived demand for millstones it is appropriate to recognize the major contribution made by stones imported from continental sources and also introduced from other parts of Britain. Pride of place for quality, though this could vary, should perhaps be accorded to the French *burr* stone, a hard open-grained sandstone from the Paris Basin.¹⁴ The hardness and cutting properties of millstones of this material made them particularly suitable for grinding wheat, though they were sometimes used as finishing stones for other cereals. Burr stones were being imported into Britain from medieval times, and by the end of the eighteenth century blocks of this stone were arriving in Britain in substantial quantity. The latter were cut into segments, cemented together and bound around with iron bands, generally at the works of urban millwrights and millstone manufacturers. A mark of their quality and appeal is no doubt evident in the fact that burrs continued to be imported during the French Wars although at the time of the Peace of Amiens in 1802-3 the price of such millstones was double the norm in Newcastle, partly because of the imposition of a high duty.¹⁵ Moreover, during the Continental Blockade they were even accorded a special import licence, at least for a short period in 1809.¹⁶ It has been estimated that at the peak of the stone-ground flour industry in the mid-nineteenth century there were perhaps as many as 30,000 to 40,000 pairs of French burrs in use in Britain, with an annual production of maybe 3,000 to 4,000 pairs.¹⁷ From amongst a number of local manufacturers advertising French burrs in the nineteenth century perhaps the firm of Robert Robinson, with a manufactory in Wideopen and

an office in Grey Street, Newcastle upon Tyne, merits passing reference, in that in 1865 its proud even if exaggerated claim was to be “the sole importer of celebrated burr stones for the North of England and Scotland”.¹⁸ The ill-fated Borough mill in Gateshead, when advertised for sale in 1837, was by no means unusual in having amongst its equipment a pair of French burr stones as well as a pair of so-called blue stones and a barley-mill. It is only occasionally that any monolithic burr stones have been noted locally, such as a small example at Newminster Abbey mill near Morpeth and a pair from Newbiggin mill near Blanchland,¹⁹ but the larger segmented stones or fragments from them occur more frequently in various local contexts. Amongst the latter may be cited stones recorded at the defunct mills at Riding Mill²⁰ and Rowlands Gill,²¹ or those now used as garden furniture at Elsdon Mill House²² in Redesdale. Three pairs of French burrs are also presently to be found in the *Under Mill* and a further pair are on display in the refurbished *Upper Mill* at Heatherslaw²³ in the Till Valley. The stones at Riding Mill had been installed in 1846 by another well known local firm, Robert Patterson of Newcastle upon Tyne, whose name is also on the fittings of a pair of stones at Heatherslaw. This is the firm which for a long time also quarried local millstones at the Bearl quarry near Bywell (v. below).

The monolithic millstones known as *blue stones* were equally popular in northern corn mills during the eighteenth and nineteenth centuries, and, surviving competition, were still used in some cases in the early decades of the twentieth century. The term itself can be misleading in that it was sometimes employed only in a general sense to signify a stone harder than a *grey stone*.²⁴ As applied locally to millstones, however, it was normally indicative of the *cullin* (Cologne) millstones which were imported from the Mayen area of the Rhineland, where the lavas had been quarried at various locations from prehistoric times onwards.²⁵ Querns or millstones of this material reached northern Britain in various contexts from at least as early as the arrival of the Roman armies into the area. Blue stones too were used for grinding wheat in more recent times but, in addition, were also used extensively for processing other crops. References to their use in Northumberland during the eighteenth and nineteenth centuries are not uncommon and a few instances will suffice by way of illustration. “Purdees” windmill near Newcastle, one of a number in the vicinity recorded as having blue stones in c. 1745, would “if fare wind grind wheat.”²⁶ A little later the esteem in which such stones were held is probably more evident in a request of 1768, concerning Hartley windmill on the Delaval estates in south-east Northumberland—“if your Honour pleases I would have a pair of Blue Stones upon ye Windmill as ye Rent is much advanced for ye Mills cannot Grind ye one half of ye Custom for I see Millers coming with flour to ye Bread Bakers from other Mills which I would think your Honour would be better satisfied that could be done at home . . .”²⁷ The slightly aggrieved tone of the request is even more understandable when it is clear that blue stones were being used at this time in other mills on the northern Delaval estates, either from direct reference or inference, as perhaps at Heatherslaw where accounts for 1769 have an entry of “6 blue stone chisels—4s”.²⁸ Blue or Blue Stone as an epithet could also at times become the name usually

attributed to the mill itself, as in the case of the Blue Stone Mill at Heaton,²⁹ the Ford Blue Mill,³⁰ the Blue Mill at Cartington³¹ and the "Blewstone Mill" at Alnwick.³² There has been no systematic examination of the sites of abandoned mills for the purpose of the present study, but from a number of instances of Rhineland stones noted *in situ* those in the disused watermill at Healey,³³ near Hexham, or one of four abandoned stones within the ruins of Grasslees watermill in Upper Coquetdale will serve as examples. All told, by the early nineteenth century, the equipment listed in the lease of Longhoughton mill in 1844 which comprised "one water wheel, one pair of Grey Mill Stones—one pair of Blue Mill Stones—one Barley Mill"³⁵ would not be unusual for a rural mill serving local needs in the county.

In addition to millstones from such prestigious continental sources, stones from elsewhere in Britain were also being brought into the area. Probably of greatest consequence amongst these were the so-called Peak stones of millstone grit from Derbyshire, quarried from at least as early as medieval times and certainly exported in number from the Humber by the eighteenth century.³⁶ Being relatively softer than the stones from continental sources they were used extensively for grinding oats, barley, rye and animal fodder. In some instances in Northumberland, as elsewhere, their use continued well into the present century; the 1945 inventory at the *Upper Mill* at Heatherslaw, for example, included a pair of Peak stones for horizontal grinding in addition to the pair of French burrs and a shelling stone. Peak stones were also used singly and mounted vertically in barley mills, as was again the case at Heatherslaw, where the main products in more recent times were pot and pearl barley from two barley mills, one in the *Upper* and the other in the *Under Mill*.³⁷

Peak stones were sometimes referred to as *grey stones*, but this term was neither petrologically nor geographically confined to the products of the Derbyshire quarries. *Greys* were merely hard sandstones or carbonaceous grits, and when the description was applied to millstones hereabouts it simply indicated that the stones were of this general nature, often though by no means exclusively being used in more recent times for grinding "common meal".³⁸ Grey stones from the millstone grits in the adjacent county of Durham were also being brought into Northumberland, probably over a lengthy period. The nearest quarries lay beyond the River Derwent on Muggleswick Fell and also between Wolsingham and Stanhope in Weardale.³⁹ Stones from the Muggleswick area were certainly employed for grinding rye in the eighteenth and early nineteenth centuries, though the local millers seem to have preferred Peak stones for their better quality.⁴⁰ At this time rye was still a crop of some significance, especially on sandy soils, and a mixture of wheat and rye known as *maslin* continued to be sown for bread in south Northumberland and Durham as late as the early nineteenth century.⁴¹ A little further afield the grits of Upper Teesdale also provided their quota of millstones, some of which found their way into Northumberland. When Billy mill (Billing's mill) on the Tynemouth demesne in south-east Northumberland was rebuilt at the end of the sixteenth century millstones were brought from Barnard Castle (Barnacastle),⁴² whilst three centuries

later millstones from the Carr Crag quarry, also in Upper Teesdale, were still being used at Felton Park mill⁴³ on the River Coquet.

As there were Blue Mills so, also, there were Grey and Greystone Mills. In 1783 the Grey Mill at Ford was recorded as being in danger of degenerating into the same deplorable state as the Blue Mill;⁴⁴ the parish of Berwick in 1799 possessed "seven flour mills, four greystone mills and four mills for making barley";⁴⁵ and in 1745 "Leazes Chimley Windmill", Newcastle, was "a Grey Stone Mill, wheat or rye will grind."⁴⁶ There were other occasions, however, where the main product of the mill seems to have given rise to the appellation rather than the nature of the millstones; thus the Grey Mill at Alnwick was said to be so named because it had been used "for grinding barley and grey peas which produced a grey mill."⁴⁷ This mixture of barley and grey peas or beans was still used for bread-making amongst the "labouring poor," particularly in the north of the county, as late as the early decades of the nineteenth century. Oatmeal too, popular in crowdies and hasty puddings, was often referred to as grey meal.⁴⁸ Whatever the respective merits of these alternative explanations two conclusions are nonetheless evident; the first is that so-called grey stones were widely used in the local milling industry; the second is that the description itself must also have applied to stones obtained from the grits and sandstones of Northumberland, to which we may now turn.

Apart from their actual grinding qualities suitable local rocks would need to have been relatively free from natural flaws, not only to minimize wastage in quarrying, which could be considerable, but also to ensure that fractures would not develop in the stones under the stress of high peripheral speeds and the heat which was engendered whilst in use.⁴⁹ That there could be more than economic loss arising from the disintegration of a millstone is poignantly illustrated, *in extremis*, by an entry of 1297 in the *Iter of Wark* to the effect that Agnes, wife of John Cooper, had been killed by part of a millstone as her husband was grinding corn.⁵⁰ The source of the defective stone is unknown, but at the time it could well have come from a Northumbrian quarry. A general indication of the relationship between certain or probable sites of millstone extraction and the solid geology of Northumberland is portrayed in fig. 1. The numeration is according to the order in which the sites are listed in the Inventory (see below), where more detailed individual locations are given, together with documentary references where these are known. Most of the sites are still extant but some have disappeared over the years since they were first noted, whilst a few have been inferred solely from documentary evidence.

One notable area of exploitation has been the great arc of the Fell Sandstone group of rocks, running from the Kyloe Hills (1) in the north, through the cuesta formations on the east side of the Till above Old Lyham (4) and Old Bewick (8), and thence by Old Rothbury (18) and Harbottle Crag (19) above Coquetdale to Byrness Hill (21) in Redesdale. This well exposed group of rocks consists of coarse-grained sandstones, the sand having been deposited originally in a series of individual layers known as units of current-bedding. There is some variation in the nature of the sandstones, those of Redesdale, for example, being somewhat finer than the more gritty formations at Harbottle, and such differences could have influenced the

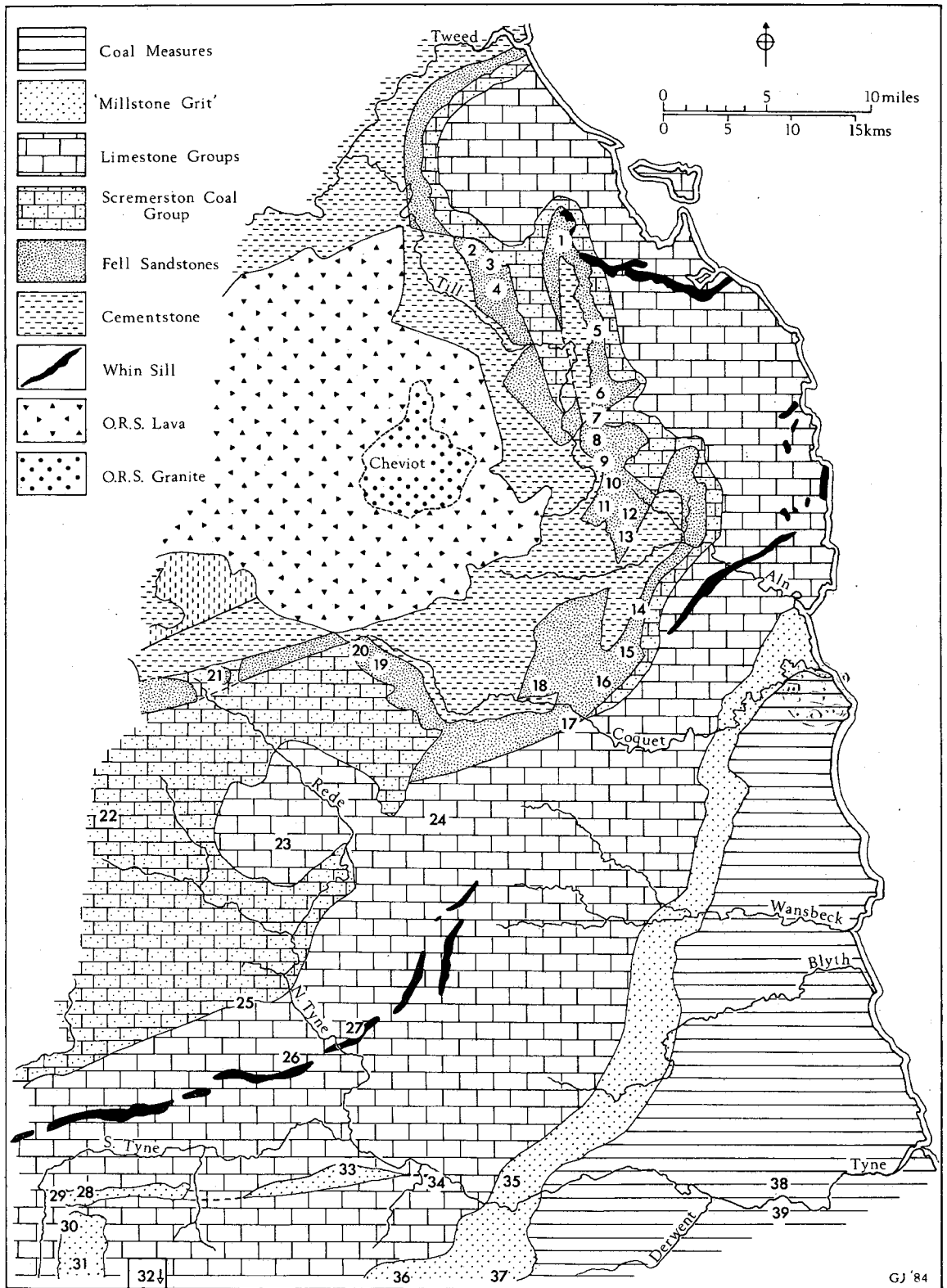


Fig. 1

initial choice of site for a quarry or the extent of its subsequent development. The tabular surfaces and tractable nature of these rocks were clearly advantageous for the extraction of millstones as indeed, for somewhat similar reasons, they had formerly provided a suitable medium for most of the prolific, prehistoric rock-markings in the county. Over the centuries the same rocks have also provided building stone, whilst less evident forms of exploitation, often in the same locations as where millstones have been quarried, have been directed towards obtaining gateposts, creeing-troughs, hones and even scythe-sand.

The Fell Sandstones provide examples of both large and small areas of quarrying for millstones, the former probably supplying mills over a wide area and possibly over a long period, the latter maybe serving no more than a single mill or estate. The most extensive of the extant workings are those on Lyham Hill (5), Harbottle Crag (19) and Beanley Moor (11). On Lyham Hill the turf-covered, circular, extraction hollows, more often than not lying cheek by jowl (fig. 2), extend for a distance of more than 1100 yards (1km) and in a band 60 yards (55 m) or more wide along the crest and tail of the crags. Whatever the wastage may have been, and from field evidence there is nothing to suggest that this was excessive, this quarry must have produced many hundreds of millstones at the very least. Documentary evidence confirms a thriving industry on the hill by the reign of Elizabeth I, when the quarry was supplying most of the mills in "Glendale, Bamburghshire and thereabouts" as well as selling "many tons" in Scotland. The linear form of the surface workings, topographically dictated, is typical of many millstone quarries on the Fell Sandstones, where the rock surfaces on the tails of the crags, if not already exposed, lie immediately beneath the thin covering of turf or heather. At Harbottle Crag (19) the exploitation of the steep south and west facing slopes above the lough is smaller in area, perhaps all told some 500 yards by 150 yards (457 m × 137 m), but in addition to the usual closely-set surface delvings (fig. 2) there are a number of deeper quarries, where faces over six feet (2 m) deep have been developed by the horizontal extraction of millstones, thus increasing the intensity of production relative to the total area covered by quarrying (pl. III). Over sixty solid, broken, or partly cut millstones lie abandoned amongst the thick heather. Documentary evidence points to the existence of a millstone quarry on these crags at least as early as the sixteenth century, which by the eighteenth century was certainly supplying many of the mills in Coquetdale, if not further afield, particularly with stones for processing barley. Beanley Moor (11) also merits special reference in that there are five areas where millstones have been quarried over a distance of no more than three quarters of a mile (1.2 km), with the possibility of a sixth area now overplanted in Beanley Plantation. No single area is as extensive as the quarries at Lyham or Harbottle, but collectively they amount to a fairly substantial exploitation of the northern part of the moor: two linear bands of surface extractions on Corbie Crag and Millstone Heugh alone each run for *c.* 250 yards (230 m) and are up to at least 70 yards (65 m) wide. Even so, it may be necessary to temper any exaggerated ideas of the intensity of the operations at any one time with the consideration that millstones were being won from the moor by at least as early as

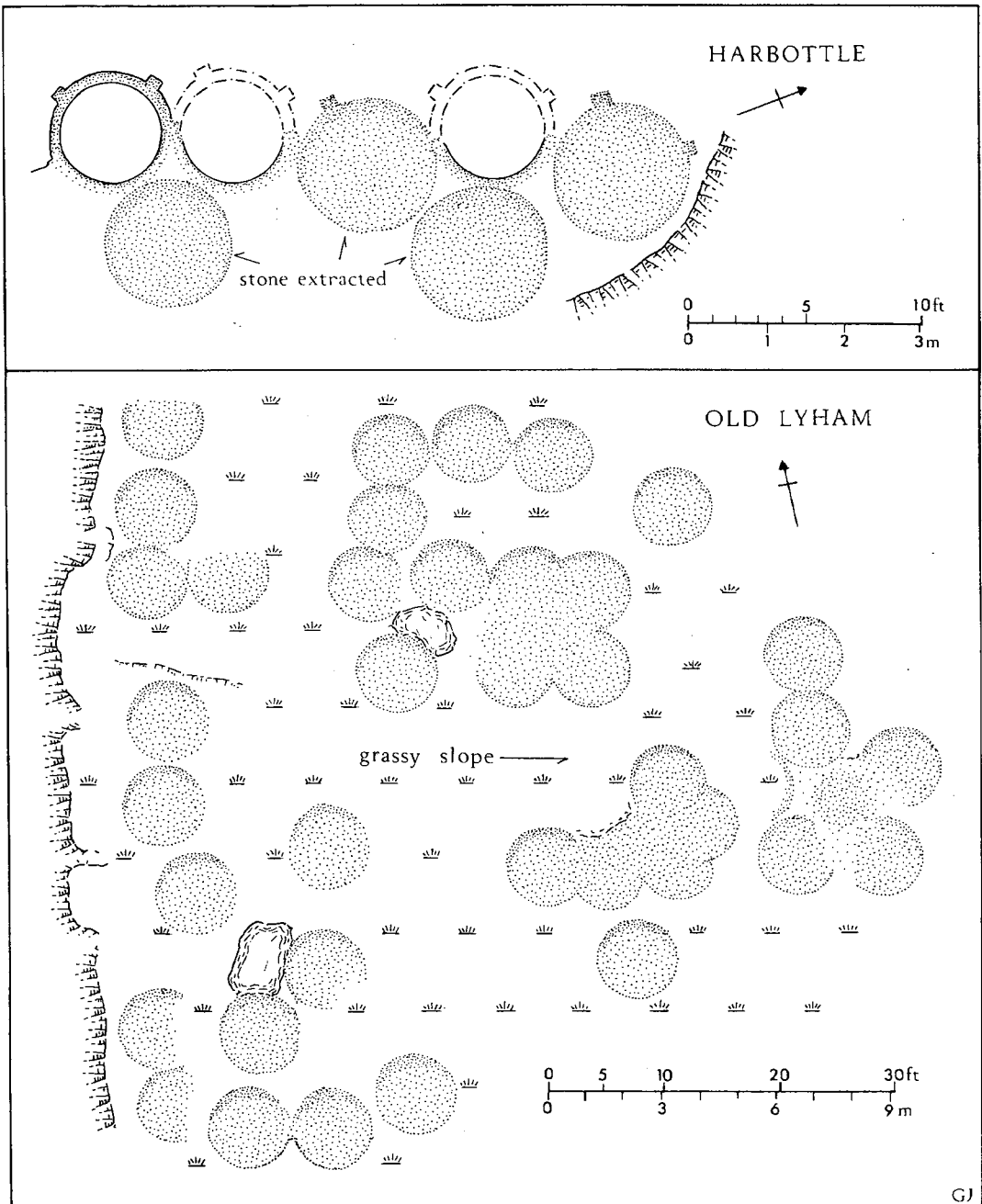
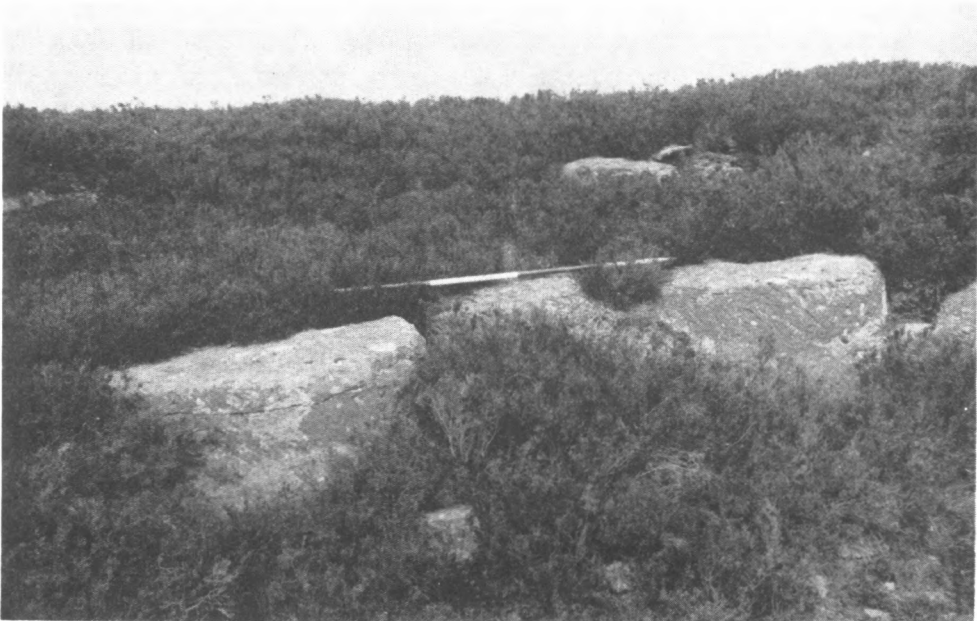
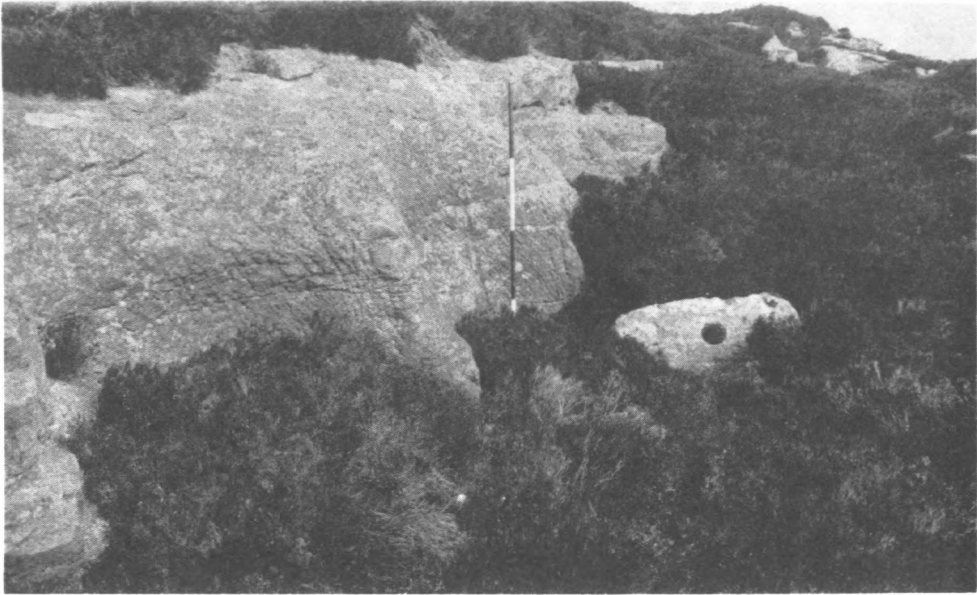


Fig. 2 (Sketch-plans)



Harbottle Crag, quarry faces.

the fourteenth century. By way of complete contrast to these larger sites, however, a minimal if not an abortive attempt at exploitation of the Fell Sandstones may be cited at Mount Pleasant (16), where there are no more than slight indications of quarrying on a number of rock outcrops and only a single, unfinished millstone lies abandoned amongst the bracken.

Perhaps more predictably the second main area of millstone production has been on the so-called Millstone Grits in the south of the county. At times this geological definition can be somewhat misleading, in that the coarse grits characteristic of the series further to the south are less notable in the north, but in the present context the description serves our purpose well enough. North of the Tyne these grits are mainly covered by a blanket of drift material and boulder clay, but they rise fleetingly to the surface to the south of Dalton, for example, and more significantly in the area of Bywell and Bearn (35). Far more extensive areas of exposure lie to the south of the Tyne, such as on the Millstone Band near to Whitfield Lough (31), the prominent bed of grit running to the south of Hexham towards Corbridge Fell (34), and the moorlands of Slaley (36). These rocks too have been worked for other purposes, and in some instances more extensive quarrying for building stone may obscure or has completely erased the field-evidence for millstone winning; the now abandoned and overgrown quarry on Corbridge Fell, from which stone was later taken for the building of the High Level Bridge at Newcastle in the mid-nineteenth century, is a case in point.

The most extensive quarrying for millstones on the Millstone Grits, albeit somewhat intermittent, is to be found along the line of the Millstone Band to the north-west of Whitfield Lough (31), where operations extend over a distance of about 1600 yards (1.4 km) at an altitude of c. 1600 feet (485 m). In addition to the usual surface extraction hollows, together with many abandoned millstones and rough-outs, two prominent quarries break the skyline with quarry-bins and worked faces up to 13 feet (4 m) deep. The latter, however, seem to have provided building stone and gateposts in addition to millstones. A more compact but nonetheless intensive area of exploitation exists on Watch Hill (28), also in South Tynedale, where a broad band of surface quarrying for millstones, together with many deeper faces, runs for a distance of about 450 yards (400 m) along the hillslope. It is reasonable to assume that quarries such as these eventually supplied millstones to mills over a fairly wide area. In the case of the much smaller quarry in Millstone Plantation (29), near Burnfoot, there can be no doubt that this was so, for in 1769 it was given as the source from which millstones were "conveyed for their goodness into remote parts of Scotland." As with Lyham Hill quarry on the Fell Sandstones in the east, however, more specific destinations in this northern trade are as yet unknown. Another quarry of sufficient significance on the Millstone Grits to have its products sent further afield, at least during the nineteenth and early twentieth century, was that at Bearn (35). In addition to the production of grindstones and pulpstones this quarry supplied millstones from its so-called "peas and barley" level to corn mills on both sides of the Border, mainly for processing barley as at Heatherslaw mill on the Till. Once again, however, there were probably quarries

which never achieved more than local significance. Although the winning of millstones from Corbridge Fell (34) was undoubtedly of some antiquity, a survey of 1663 knew of "noe quarries but of common walling stones, millstones and lymstones, *but of small or noe value.*" In the division and enclosure of the commons, moors and wastes of Corbridge in 1779, however, an award of the "Millstone Quarry ... on Millstone Quarry Road" was made, but this was then just over 1 acre (0.4 ha) in extent and presumably not all of this could be or was used at any one time for the quarrying of millstones. All told, in terms of either maximum extent or the variety in the sizes of individual areas of quarrying, there would seem to be little meaningful difference between the operations on the Millstone Grits and those on the Fell Sandstones.

With a few exceptions, and some of these of only minor importance, the remainder of the geological formations in the county provide little in the way of evidence for millstone quarrying. North of the Tyne the Limestone and Coal Measures are generally covered by deposits of glacial drift, but there are some places where the solid sandstones of these groups do reach the surface. The latter have often been quarried for grindstones and whetstones, as testified for example at Ravensheugh Crags⁵¹ in North Tynedale, Shildon Hill⁵² near Corbridge, or Bedlington, Ashington and North Seaton on the coastal plain.⁵³ Some of the products of the coastal sites were even exported through minor ports such as Cambois on the Blyth or Warkworth on the Coquet in the eighteenth and earlier nineteenth centuries.⁵⁴ Likewise, grindstones were also obtained from the Grindstone Sill around Allenheads and Coalcleugh⁵⁵ in the far south-west of the county. But none of these quarries seem to have been noted for the production of millstones for the processing of cereals and animal fodder, though doubtless they for long provided stones for sharpening the chisels and bills of local millers and millwrights. The one major exception in this respect would appear to have been the large quarries at the heart of the grindstone industry around Gateshead and Newcastle upon Tyne (38, 39). In the nineteenth and early twentieth century, for example, the well known firm of Richard Kell and Co. manufactured large quantities of millstones "for grinding and shelling barley and rice," in addition to their main production of grindstones and pulpstones from their quarries on the south side of the Tyne.⁵⁶ Even so, if these millstones were of local stone and not brought into the manufactory from elsewhere, it is reasonable to assume that they were probably edge or vertical runners and not face-grinding stones. Whilst the history of the grindstone industry on Tyneside can be traced back to the thirteenth century, there is only one reference known to the writer which could point to millstones being worked from the sandstones of the lower Tyne valley at an early date, this at Elswick (39) on the north bank, where in 1337 a quarry was "demised for 30s at the feasts of the Nativity of St John the Baptist and St Martin in winter by equal portions, or 3 *little millstones for the mill* and 5s as it shall but please the lord and his servants to receive."

The most common method of horizontal surface-extraction, particularly evident on the Fell Sandstones, consisted of an initial inscribing of a circumference from a pecked centre point which was subsequently used as a guide for the cutting of a

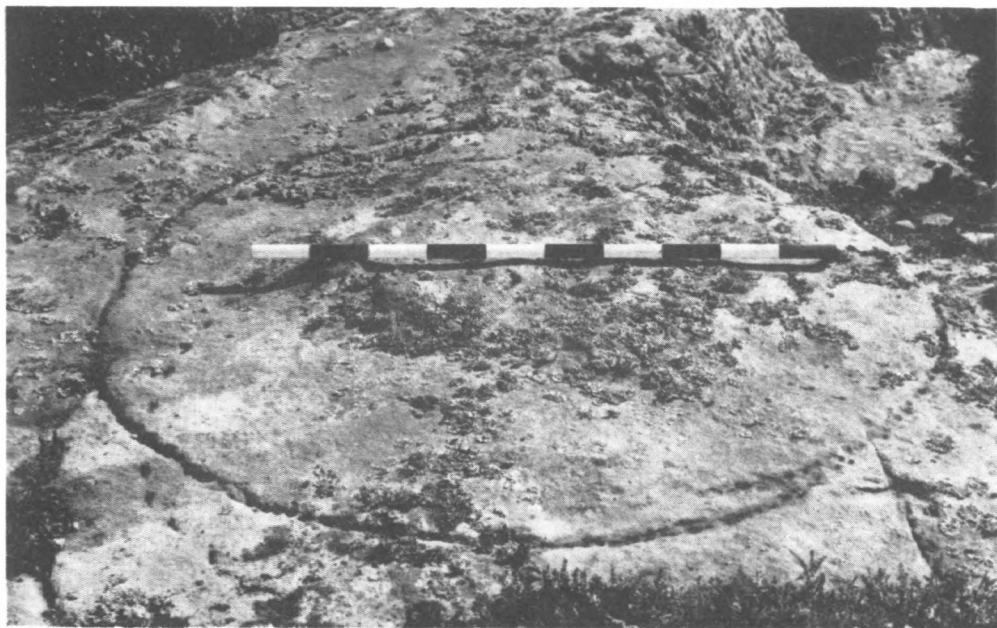
peripheral channel, anything from $3\frac{1}{4}$ to $6\frac{1}{2}$ inches (82–165 mm) wide, down to the thickness required for the millstone or to a suitable bedding plane in the rock (fig. 2; pls. IVa and VI). Generally, though not invariably, additional slots were cut radially into the outer edge of the extraction channel, either in order to drive in wedges or to insert the long crowbars, known as *pinches*, which were used to detach the millstones from the parent rock. Normally these short radial slots were four in number, equally spaced around the circumference of the channel, but as many as eight have been noted on Lyham Hill. The widths of the extraction channels would seem to have been generally in proportion to the diameters and thicknesses of the interior millstones, whilst their inner faces, which formed the edges of the millstones, were so well cut as to make additional edge-dressing of the stones almost unnecessary after their removal. A somewhat similar method of detaching millstones from the living rock is described in Diderot's *Encyclopedie*,⁵⁷ except that in the eighteenth century French industry wooden wedges were inserted and water poured into the channels, thus causing the wedges to swell and promote cleavage from the parent rock. There is no corroborative evidence for this latter practice in Northumberland, however, and unless there had been temporary water-butts some of the local quarries are uncomfortably distant from a water supply.

Once the millstones had been removed by this method all that remained were the extraction cavities, now generally overgrown but occasionally seen to better advantage as within the hillfort at Old Bewick (9), where seventy years ago the purpose of one particular example prompted considerable but unresolved speculation amongst members of the Berwickshire Naturalists' Club. As already noted these extraction hollows can occur in close proximity one to another over considerable areas and sometimes, where millstones have been removed horizontally in layers, vertical faces have been created consisting of a number of curved serrations or scalloped edges, according to the stage at which operations have been abandoned (pls. III & IVb).

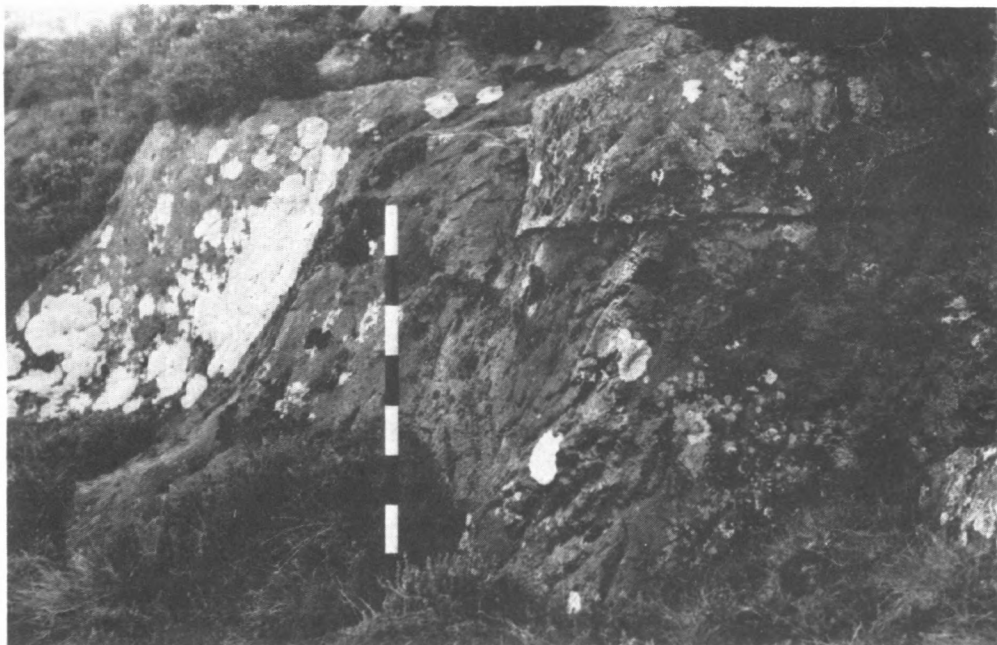
The same method of extraction was also used on the Millstone Grits, but from the nature of some of the vertical faces in the deeper quarries, as well as the wastage, it would appear that in many instances, and more so than on the Fell Sandstones, large square-shaped slabs were first removed for subsequent dressing into shape by *keveling* on the hillside or quarry floor.

Central holes in the eyes of the stones were cut on site, though they may well have required further attention when the final feathering of the grinding surfaces was carried out, presumably at the mills since no completely dressed millstone has been found at a local quarry. The practice of cutting a cross on the rough faces of a millstone, as an indication of the level to be achieved in subsequent dressing, has not been encountered locally, but this is not to deny a practice which seems to have been followed in both the Derbyshire and the Anglesey millstone quarries.⁵⁸

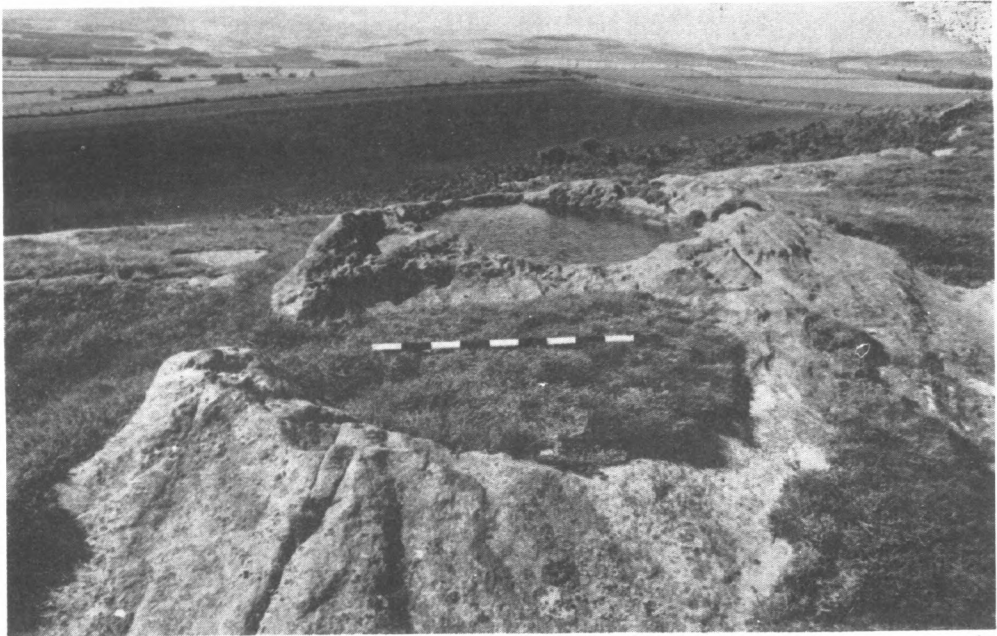
Dimensions of the millstones being quarried at various sites throughout the county have been taken from the many abandoned stones, complete or broken, as well as from those still attached to the parent rock. A scatter diagram demonstrates that there are no discernible differences between the products from the two main rock



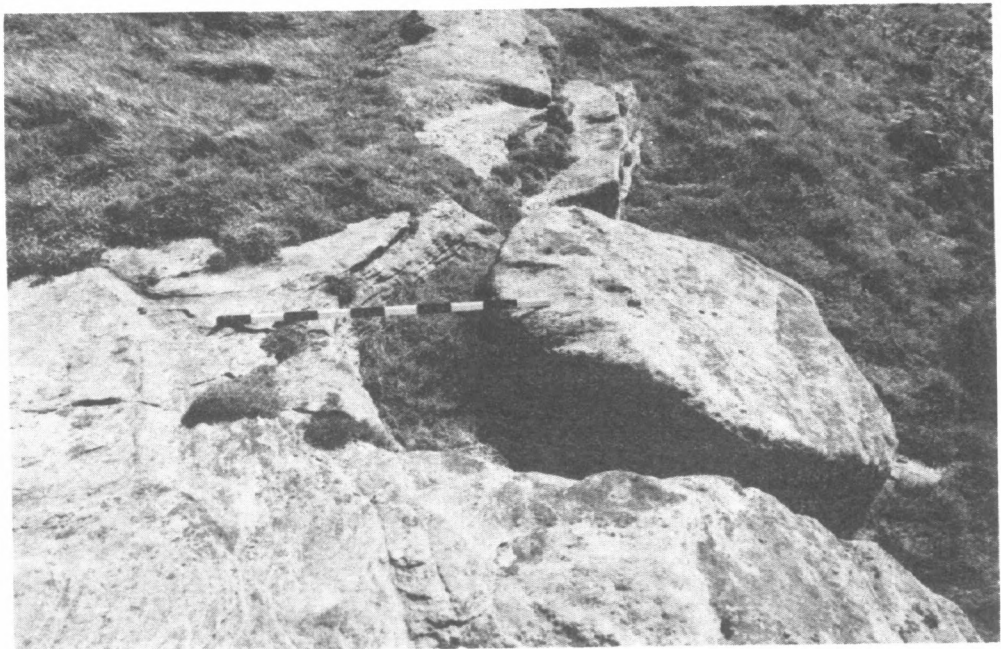
Doddington North Moor: a) pecked and grooved outlines.



Doddington North Moor: b) quarry face.



Lyham Hill: a) extraction hollows.



Lyham Hill: b) abandoned millstone.

formations or, for that matter, from different quarries, but that three groups can be distinguished overall on the basis of their dimensions.

Evidence for the first group is unfortunately confined to no more than half a dozen inscribed surface markings, supplemented by a number of small, shallow, extraction hollows. With probable diameters falling between $10\frac{1}{2}$ inches (0.27 m) and 19 inches (0.48 m) these stones were presumably hand-operated querns, flat in form and no more than a few inches thick. It would be hazardous to infer more about their context other than that these were not the beehive or bun-shaped type found on Iron Age and Romano-British settlements hereabouts, the local quarries for which continue to remain elusive. However, disc-like querns also occur on native settlements of the Roman period and many Roman military hand-mills of grit and sandstone have similar dimensions, as indeed do those from medieval domestic contexts. Although in medieval times there may be frequent and explicit prohibitions on the use of hand-mills for grinding corn they also serve to remind us of their presence, as well as the difficulty there was "to wean men from old habits" despite the "rigour of the proprietors of the mills."⁵⁹

The evidence for a second group rests upon a number of broken stones, well scattered over the area as a whole, and on the dimensions of stones which have not been removed from the parent rock, as, for example, at Little Mill (17) and Hunterheugh (12) on the Fell Sandstones (pl. VIa). Diameters of the millstones within this group fall between $24\frac{1}{2}$ inches (0.72 m) and 35 inches (0.9 m) and the original thicknesses probably did not exceed 5 inches (127 mm) or so. Extraction channels are from *c.* 3 inches (76 mm) to 5 inches (127 mm) wide and, as found, have depths of no more than $3\frac{1}{2}$ inches (89 mm), but further cutting may have been intended. Once again neither provenance nor typology can give any unequivocal indication of a general context. In the north and west of Scotland similar millstones, 30 inches or so in diameter and about 5 inches thick, have been seen as probable equipment for the small horizontal water-mill which was in use thereabouts until comparatively recent times. But the evidence for such mills further to the south is still limited, whilst the aforementioned fourteenth century reference to "little millstones" for the windmill at Elswick could provide an equally plausible but unproven explanation. It should be added at this juncture that none of the stones in these first two groups would appear to have been intended as grindstones; nor can they be seen as possible centre-pieces of cheaper local stone for larger millstones having an outer ring of more expensive burr segments, an economy certainly practised north of the Border.⁶⁰

By far the majority of the abandoned millstones are in the third category, and it is to this group also that almost all of the visible extraction hollows must be assigned. Diameters fall between the limits of *c.* $43\frac{1}{2}$ inches (1.1 m) and 63 inches (1.6 m), with almost ninety per cent between 52 inches (1.32 m) and 60 inches (1.5 m). Thicknesses at the edges are between $8\frac{1}{4}$ inches (210 mm) and $13\frac{3}{4}$ inches (350 mm). Millstones of these dimensions are in use from medieval times onwards and may be seen in or hard by the ruins of a number of local corn mills.

At a very general estimate of 15 to 16 cubic feet to the ton many of the millstones



Extraction channels: a) Little Mill.



Extraction channels: b) Old Rothbury.

in this last group would weigh about a ton. The immediate movement and manoeuvring of such bulky and weighty objects in the process of quarrying and dressing was clearly no problem, though some undoubtedly fractured in the process. On the other hand, the locations of many of the local quarries, as indeed of those elsewhere, raise questions as to the means of transportation of the millstones, particularly in the initial stages of their journey. Whereas in some cases the terrain would allow approach by a well defined route, capable of being used by wheeled transport, as presumably was the case with Millstone Quarry Road on Corbridge Fell (34), there are other places where the use of carts and waggons would have been difficult if not impossible. Perhaps half of the journey of two and a half miles from the quarries near Whitfield Lough (31) down to the valley floor in Knarsdale would have been unsuitable for laden, wheeled vehicles. And though the distance may be less, the ascent or descent of wheeled traffic to and from Harbottle Crags (19) is unthinkable in this context. Although local documentary evidence is not explicit, the answer must surely have been in the use of horse-drawn sledges or *hoys*, such as were certainly employed at Carr Crags millstone quarry in Teesdale.⁶¹ It so happens that in Whitfield parish in the eighteenth century there was reputedly “not a cart in the county”, whilst in adjoining Knarsdale in the early nineteenth century sledges were much in use instead of carts, owing to “the badness of the roads and the steepness of the far greater part.”⁶² Many of the so-called hollow ways which run past or even directly to or from the quarries listed in the Appendix are not inconsistent in form with the passage of sledge traffic, as can be seen to advantage at Harbottle (19) and Millstone Hill, Chatton (7). Another method of moving millstones to a convenient and practicable loading point could have been that employed in Derbyshire, even though it provoked the concern of Daniel Defoe for the safety of Chatsworth House, lying somewhat vulnerably below one of the quarries.⁶³ This was to draw a pair of millstones on a wooden axle, a more sophisticated version, as it were, than that attributed to some eighteenth-century Scottish tenants, who ran a single stone on a pole through the central eye when they were required to transport stones from the laird’s mill to their own homes for dressing. In more recent times large grindstones were undoubtedly moved in this manner for shorter distances on quarry floors and in factory yards.

Cartage of millstones to the manorial mills in medieval times frequently devolved upon the tenants as one of their stated services. And where there was total exemption from this burden the fact was specifically recognized, as exemplified locally in the *Boldon Book* of the late twelfth century, where certain Bedlingtonshire freemen and their tenants in Netherton, Sleekburn and Cambois, together with their heirs, were exempted from certain services including the carrying of millstones⁶⁴—a relief not accorded to others in the Bishop of Durham’s demesnes in Northumberland. In some instances, and from a fairly early date, this service together with others was commuted into an annual payment, so that in lieu of carting millstones for the Prior of Tynemouth in the thirteenth century, for example, we find certain tenants of East and Middle Chirton making payments of 1½d as “milne silver” on the feasts of St. Peter and St. Paul.⁶⁵ In other places, however, the physical obligation continued

until much later in history as is evident, say, in the baronial court records of Alnwick, where at the end of the seventeenth century copyholders were still liable to cartage of thorns, turves, coals, slate and straw to the Castle and millstones to the mill, and in 1682 one Edward Adams was duly amerced 1s. for refusing to lead millstones to Longhoughton mill.⁶⁶

A rudimentary picture of the movement of millstones to medieval mills and markets in the locality may also be seen in the royal licences to levy tolls. Millstones appear as a regular item in local lists in the thirteenth and early fourteenth century, being levied under pontage at Berwick, Corbridge and Haydon Bridge, under murage at Newcastle and under quayage at Newbiggin on the coast.⁶⁷ It is also reasonable to infer that at times transport of such bulky objects by water would have been more advantageous than transport overland. In 1295 certain freeholders of Preston, in addition to doing suit to the Prior of Tynemouth's hall and mill, were required to cart millstones from Slaley (36) to all the Prior's mills "along with their peers in the liberty of Tynemouth." This is one of the few instances where early documentary evidence gives the source of the stones as well as their destination, the round trip being as much as 70 to 80 miles (113–129 km). On the laden return journey there could well have been some advantage in using the navigable waters of the Tyne, at least below Newburn. Other bulky cargoes, including timber for mill construction, were certainly being moved along the waterway at this time, and significantly the lease of 1337 for the stone quarry at Elswick (39) included an annual charge of 40d "for a way from the quarry to the water of Tyne." At the end of the sixteenth century, millstones brought from Barnard Castle to Billy mill were transported specifically "by land and water," in this instance presumably down the Tees and thence coastwise to the mouth of the Tyne, where they were unloaded at North Shields (the Sheles) for the final, uphill haul to the mill.⁶⁸ During the eighteenth and early nineteenth century millstones were still being shipped coastwise over distances no greater than the length of the county, many no doubt now from the millstone and grindstone manufactories on Tyneside. Millstones featured regularly amongst the freight rates of the two sloops *Industry* and *Betsy* which plied constantly on the short haul between Newcastle and Berwick at the turn of the eighteenth and nineteenth century, when the rate for a large millstone was 18s.⁶⁹ As will shortly become evident, many of the local millstone quarries probably did not survive long enough to benefit from the use of the railway. An interesting exception, however, was the quarry at Bearl (35) where access to the Newcastle and Carlisle Railway, opened in 1838, was made possible by the construction of the present bridge over the Tyne at Bywell in the same year, at the not inconsiderable expenditure of almost £17,000 by the landowner.⁷⁰

For the present it is difficult to give anything more than a general indication of the periods over which various areas or quarries were being exploited for millstones. The local equivalent of a Domesday record, the *Boldon Book*, was not compiled until 1183 and it contains no direct references to millstone quarries. Even so, it may be inferred from some of the entries concerning the service of cartage that some local sources in Northumberland and Durham were being exploited by the later

twelfth century, if not before. On the Northumberland Millstone Grits millstones were ostensibly being won from the moors of Slaley (36) during the thirteenth century, in that in 1278 William of Slaley had granted to the son of Thomas of Kellow the message of Slaley mill together with the right, amongst others, "to seek and carry millstones within the fief." Less than twenty years later, as we have already seen, the Prior of Tynemouth's mills were also being supplied from the same area. It is probable that Corbridge Fell (34) too was being exploited at the same time, since by an agreement of 1304 between Robert Fitz Roger and the widow of Thomas of Diveson, she and her men were allowed to take millstones and turves from the "wastes of Corbridge" for the upkeep of Dilston mill and mill-dam. As the Dilston lands were on the south side of the Tyne and the bridge at Corbridge was broken down at this time it is reasonable to suppose that the "wastes" were those on the Fell, also on the south side of the Tyne, where the later millstone quarry is well attested. The grits on the north side of the Tyne in the area of Bearl (35) and Bywell were doubtless providing millstones before 1526, when Thomas Baytes leased a millstone quarry in Bywell for 24 years at 13s. 4d. per year, together with the obligation to find millstones for the mills at Bywell and Ridley which he also rented for £10 annually. Away to the south-west, in South Tynedale and more doubtfully West Allendale, documentary evidence which is both early and satisfactory is even more limited for the present, though this should not be taken as an indication of a later development of millstone quarrying in the area. On or just beyond the boundary of Northumberland *Millstones* occurs as a feature or place-name in the Alston Manor Paine Roll, dated to the reign of Henry VII.⁷¹ Similarly *Milnstones* (32) was also the name of one of four holdings in Parmontley, West Allendale, in 1607, possibly in the area of the present *Millstone Syke*. What is probably a reference to the millstone quarry on Watch Hill (28) near Broomhouses in South Tynedale occurs in a somewhat later deed granting the manor of Bellister to John Blenkinsop in 1667, when "milnstones" belonging to the manor are mentioned and Broomhouses was certainly in the possession of the Blenkinsops. No certain references to the quarrying near Whitfield Lough (31) or Burnfoot (29) have been found prior to 1769, but as the former is extensive and the latter, as we have seen, was already exporting to Scotland by that date it seems likely that both sites could have been worked well before this.

On the Fell Sandstones the potential, if not the actual exploitation of Beanley Moor (11) was already recognized by 1320, when William of Beanley granted to John Lillburn and his tenants of Shawdon permission to take from the moor "peat, turves, heaths and millstones for their mills of Shawdon." Moreover, the comparatively low cost of the millstones installed in 1381 in the mill at Fenham (see below) not only suggests a fairly local source but also the possibility that the nearby Fell Sandstones in the area of Kyloe(1) were likewise providing their quota of millstones as early as the fourteenth century. Names such as *Millstone Burn* and *Millstone Cleugh*(15), the latter first appearing in the bounds of Rothbury Forest as delimited in 1539, as well as in later proceedings regarding Edlingham Common in 1611, are at least potential indicators that millstones were being obtained from the

moors in the region of Framlington Gate by the earlier sixteenth century, if not long before. There can be little doubt that Lyham Hill(5) was also being exploited by the same period, as the quarry there was already rented at 2s per annum in 1563 and by then was sufficiently well established to be sending millstones into Scotland. Much the same may have been the case on Harbottle Crag(19), where at present the *terminus ante quem* for the operations rests on the record of 1604 in which Persivall Potte, tenant of the mill at Holystone, held the crags at a rent of 3s 4d and the digging of millstones was valued at £10 per annum. On the other hand, two further quarries on the Fell Sandstones are not recorded previous to 1769, when Wallis mentions in addition to Harbottle a second millstone quarry in Coquetdale. "near to Rothbury east mill" (i.e. the Thrum mill v. 17), as well as a quarry of "good note" on Bewick Common(9). Once again, however, this is not to deny the possibility of much earlier beginnings for both.

Terminal dates for individual sites have been equally difficult to establish, except within broad limits. The extensive quarrying on the Fell Sandstones at Lyham Hill(5) could well have ceased by as early as the mid-eighteenth century. It is not shown as a feature on estate plans of Lyham in 1758, nor is it mentioned by Wallis in 1769, whilst on later mid-nineteenth-century estate maps the hill itself, known as Pace Hill, is marked simply as being a "Grassy Waste." On the other hand, operations at Harbottle(19) appear to have continued longer and not to have ceased until the early nineteenth century. Although the evidence is no better than negative, Harbottle was probably the last area to be worked for millstones on the Fell Sandstones. No nineteenth-century references have been found relative to the working of any of the remaining sites on this group of rocks, and it may be instructive to note, for example, that the usually well informed surveyor Henry MacLauchlan was at first unaware of the nature of the millstone cuttings on Little Hill(17), when he visited the site in the mid-nineteenth century, until enlightened by George Tate of the Berwickshire Naturalists' Club.

By way of a numerically small but perhaps significant contrast at least some millstone quarries on the grits in South Northumberland continued to operate into and during the nineteenth century, as indeed did those on the Millstone Grits at Collier Law and Carr Crag in County Durham.⁷² In South Tynedale a millstone quarry near Asholme (30) was still working in 1828 though it had ceased to do so before 1840, as also had the quarry on Watch Hill, Broomhouses(28). The quarry on Corbridge Fell(34) was presumably still producing millstones at the time of the enclosure award in the late eighteenth century and may well have continued to do so until it became the High Level Quarry in the mid-nineteenth century. However, its ownership in the 1880s by Dixon and Son, described as millstone and grindstone manufacturers, is not in itself proof of an even later continuance as a millstone quarry, since this firm also had interests in the Gateshead industry and imported stones. On the other hand, as already noted, the quarry at Bearl(35) certainly continued to provide millstones until the Second World War, numbering amongst its customers the cornmilling firm of John Hogarth Ltd. of Kelso, the last commercial tenants of Heatherslaw mill in 1949. Here the millstones from Bearl, albeit mounted

in the barley mills where there was excessive wear, required replacement about every nine months in a two-day operation.

Very little information is readily available concerning the prices of millstones obtained from local sources, and it could be argued that any excursion into the field of comparative prices is at best hazardous. Even so, the first general observation which can be made relating to costs is that the provision of millstones, from whatever source or of whatever size, probably called for an appreciable initial expenditure proportional to the total cost of constructing earlier mills. In 1597 when Billy mill, then a post-mill, was completely rebuilt, the cost of obtaining the pair of millstones from Barnard Castle was £6 15s 8d in a total expenditure of £37 10s.⁷³ In this instance the millstones cost slightly less than the £6 16s 8d spent on obtaining the timber from Hedley and Prudhoe woods and its transport by land and river; but this second sum also included 10s paid to the bailiff for his expenses in "gathering and pressing" the tenants, together with additional payments amounting to 9s for drink bestowed, the latter no doubt providing a measure of the tenantry's initial lack of enthusiasm. The nearby watermill at Marden was rebuilt at the same time, and there £6 was spent on procuring a pair of millstones in a total expenditure of £23 17s 0d: needless to say the freeholders of Prudhoe were no less unwilling to assist in the leading of timber to Blaydon staith.⁷⁴ Over a century later, when extensive repairs had to be made to Hallington watermill in 1716, the cost of replacing a pair of broken stones at £10 was still almost equal to the cost of all other materials.⁷⁵ In later more ambitious structures the proportional cost of the first set or sets of millstones was perhaps not so great, though it continued to remain a considerable item of expenditure.⁷⁶

Faced with such initial and, indeed, recurring expense for the replacement of millstones, it is not surprising to find that sometimes the tenants of local mills were equally interested in leasing local millstone quarries. Thus we find that the sixteenth-century tenants of the mills at Bywell and Ridley were also the lessees of the millstone quarry at Bywell(35) and that the seventeenth-century tenant of the mill at Holystone also rented the nearby Harbottle Crag(19). By much the same token it was seemingly worthwhile, from an early date, to cart partly used millstones over some distance from one mill to another should the occasion arise, particularly in the case of quality stones. And unless there has been a documentary transposition of the place-names this would certainly provide the most reasonable interpretation of an otherwise unusual local order of 1626,⁷⁷ whereby tenants of Moralee in the Tyne valley were pressed to convey millstones from Bothal on the Wansbeck, an unlikely and certainly unrecorded natural source, to Bywell in the Tyne valley, where we have already noted a millstone quarry or quarries of long-standing.

It is further evident that over the centuries millstones obtained from local sources, or of British origin generally, had at least the semblance of a market advantage in being much cheaper than imports from the continent. When both were readily available, however, the difference in price may not always have been very important in a competitive sense, because of the differences in quality and the purposes for which the stones were required. Moreover, the following examples of comparative

costs can only be taken as token indicators, since prices varied with the sizes and the quality of stones even when they came from the same quarry. In 1337, on the basis of the alternative rent for the quarry at Elswick (38), the "little millstones" provided for Elswick mill can probably be valued at about 8s 4d each. This would seem to fall generally within the price range for stones obtained from indigenous sources elsewhere, 11s 8d being the average price for a millstone of Buckinghamshire origin in the years before the Black Death, as calculated by Rogers.⁷⁸ By way of contrast, a continental import in 1337 at Ipswich, presumably the port of entry, cost 33s 6d and this was by no means the most expensive of imported millstones in the early fourteenth century. Later in the same century, 12s was paid for a pair of stones in 1381 for the monks' mill at Fenham in north Northumberland, this at a time when sheep for the monastic kitchen on Holy Island were being bought at 14d each.⁷⁹ The price of these stones at 6s each would compare with the 5s paid for a millstone in the same year at Finchale Priory in nearby Co. Durham, both presumably being of fairly local origin. Rogers' estimate of the decennial average price of millstones of Buckinghamshire conglomerate over the period 1381-90 is 13s 4d for a single stone, as compared with the average of 66s 8d for imported stones. No prices are readily to hand for Northumberland millstones during the fifteenth century but a number of entries in the Finchale accounts between 1427 and 1473, conceivably for stones from the northern Millstone Grits, fall between 13s 4d and 23s the pair, with two pairs at 19s and 26s where carriage is included. The best imported stones during the same period seem generally to have been anything from four to six times more costly.⁸⁰ At the end of the sixteenth century the pair of millstones brought from Barnard Castle to Tynemouth would appear to be somewhat expensive at £6 15s 8d, even with carriage, when compared with some of the prices of indigenous stones elsewhere, although a pair of continental stones at Oxford in 1599 had still cost well over twice as much at £15. During the wars with France in the late eighteenth and early nineteenth century British millstones of good quality were possibly even more favourably placed with regard to price, at a time when a pair of good French burrs could cost as much as 60 guineas in Newcastle, rather than the more normal 30 guineas, and by 1811 a pair of 5 ft diameter Peak stones at 10 guineas or 5 ft 4 ins diameter at 12 guineas⁸¹ were still just one third of the price of French burrs. By about 1860 the price of French burrs of 5 ft diameter had risen to as much as £70 the pair, compared with £30 the pair for large, good quality Peak stones, although as always the prices continued to vary considerably according to the quality and size of the stones.⁸² At this time millstones from the more northerly Millstones Grits at Collier Law in Weardale were being advertised at only £8 to £11 the pair,⁸³ nearer to the prices of the cheaper kind of Derbyshire stones. By then, however, as we have seen, the millstone quarries on the Northumberland Fell Sandstones had long since ceased to operate and those on the Millstone Grits had also been reduced in number. Even so, it is reasonable to assume that their products, as those from Collier Law in Durham, had never ever commanded the prices or the respect of the better quality Peak stones.

Finally, by way of providing a brief, chronological summary, it is evident that face-

grinding millstones were being obtained from some places on the Fell Sandstones and Millstone Grits of Northumberland by the later thirteenth century and possibly well before this. Many of the thirty or so areas of millstone quarrying, which are still to be seen on both rock formations, no doubt arose because of and continued to serve mainly local needs, perhaps over lengthy periods. Compensation for any lack of outstanding quality in these local products, by comparison with millstones from elsewhere, could have been found in their ready accessibility and at least relative cheapness. Moreover, it can be assumed that they were generally suitable for processing oats and barley, a factor which for much of the county and over a long period was more important than the production of wheaten flour.⁸⁴ By the later sixteenth century it is possible that a few quarries were commercially more developed and serving the needs of wider areas. In one instance at least, on the northern Fell Sandstones, millstones were being sent into Scotland, where the milling requirements were doubtless broadly similar to those in Northumberland. A Scottish market is also subsequently attested for the products of a quarry on the Millstone Grits in the second half of the eighteenth century. Though it can be no more than surmise, it is possible that some of these millstones could by then have been destined as malt stones for the developing Scottish liquor industry, as indeed was some of the Northumberland barley.⁸⁵ The winning of millstones from the Fell Sandstones appears to have waned early, and probably ceased altogether with the demise of the Harbottle quarry in the early nineteenth century. Redesdale apart, this was before the main decline in the old-style milling industry and certainly long before the introduction of mill rollers. It is difficult to relate this decay directly to any radical change in the nature of the crops being grown or to land enclosures, still less to the creation of exclusive grouse moors.⁸⁶ perhaps it was due to no more than the increasing use of foreign stone and effective competition from better quality grey stones from outwith Northumberland. Some millstone quarries appear to have continued in operation on the Millstone Grits for a while longer into the nineteenth century, but only that at Bearl continued to produce millstones into the twentieth century and at least latterly these were for vertical use in barley mills. In times of a declining market for millstones, this particular quarry must have found support in the diversification of its products, as it was also turning out pulpstones and grindstones for the industries of Tyneside as well as elsewhere. To this extent it resembled some of the larger and more notable grindstone quarries on Tyneside which also seem to have continued to produce stones for processing barley and rice.

NOTES

¹ Hodgson, J., *A History of Northumberland*, II i (1827), 83-4. His figures of working mills have been questioned (*AA*⁵ X (1982), 169) but not so as to affect the general argument.

² Dixon, D. D., *Upper Coquetdale* (1903), 361. Between 1851 and 1881 the number of men

engaged in the milling industry in England and Wales had fallen by about one third, although the population had increased by about one third (v. e.g. Skilton, C. P., *British Windmills and Watermills* (1947), 11).

³ *NRO*, ZRI 27/4/86 (*An Account of the Wind*

Mills and Wator Mills Nigh and about two Myles of Newcastle.

⁴ Longstaffe, W. H. D., *The New Castle upon Tyne*, AA² IV (1860), 85.

⁵ NCH XIII (1930), 471.

⁶ Good's *Directory of Berwick, Tweedmouth and Spittal* (1806), 154.

⁷ Mackenzie, E., *A Descriptive and Historical Account of the Town and County of Newcastle upon Tyne* (1827). In 1812 there had been 7 steam-powered mills according to Hodgson, J., *The Picture of Newcastle upon Tyne*.

⁸ Manders, F. W. D., *History of Gateshead* (1973), 62.

⁹ Clephan, J., *The Painter Heugh, Newcastle, and the Wind Mill*, AA² XI (1885), 8.

¹⁰ *Chambers Encyclopaedia* (1877 ed.), vol. VI, 455ff.

¹¹ Clephan op. cit., 7.

¹² For some details *re* other local mills v. NRO, ZMD 132/1 and Atkinson, F., *Industrial Archaeology of North-East England* (1974).

¹³ The 'new process' was basically a technique employed in the setting of the stones, already in use before the introduction of rollers. I am indebted to Mr. R. Bibby for consulting the files of the *Morpeth Herald* *re* the contents of the East Mill at that time.

¹⁴ Ward, O. H., *Millstones from La Ferte-sous-Jouarre, France*, *Ind. Arch. Review* VI (1982), no. 3.

¹⁵ e.g., *Svedenstierna's Tour 1802-3* (1973).

¹⁶ Syson, L., *British Water Mills* (1964), 110.

¹⁷ Tucker, D. G., *Millstones, Quarries and Millstone Makers*, *Post Med. Arch.* 11 (1977), 10.

¹⁸ Ward's *Directory 1865-6*. Unless the reference is to monolithic burr stones and not burr blocks v. e.g. J. Smith & Son, Edinburgh, in *Slater's Directory 1858*.

¹⁹ Stoyel, A., *Millstones in the North East*, *Ind. Arch. Group for NE*, no. 2.

²⁰ Baldwin, C. E., *Riding Mill*, *PSAN*⁵ I (1953), 179-84.

²¹ Stoyel, op. cit.

²² Charlton, D. B. & Day, J. C., *Excavation and Survey in Upper Redesdale*, AA⁵ X (1982), 166.

²³ *Heatherslaw Mill Guide* (1977). These mills were formerly known as Ford Corn Mills.

²⁴ e.g. Brockett, J. T., *North Country Words* (1866), I, 200.

²⁵ Crawford, O. G. S. et al., *The Quern Quarries of Mayen in the Eifel*, *Antiquity* XXXIX (1955),

68-76; Dunning, G. C., *Trade Relations between England and the Continent*, *Dark Age Britain* (ed. Harden, D. D., 1956), 232; Major, J. K., *Manufacture of Millstones in the Eifel Region*, *Ind. Arch. Review* VI (1982), no. 3.

²⁶ NRO, ZRI 27/4/86.

²⁷ NRO, 2DE 16/1/5.

²⁸ Accounts displayed at Heatherslaw.

²⁹ NRO, ZRI 27/4/86.

³⁰ NRO, 2DE 4/10/39.

³¹ Dixon, op. cit., 361.

³² Tate, G., *History of the Borough, Castle and Barony of Alnwick* (1866), I, 454.

³³ Stoyel, op. cit.

³⁴ The millstones are not all from Harbottle quarry as suggested in AA⁵ X (1982), 152.

³⁵ NRO, ZME 20/1.

³⁶ Radley, J., *Peak Millstones and Hallamshire Grindstones*, *Trans. Newcomen Soc.* 36 (1963-4), 165-73. Russell, J., *Millstones in Wind and Water Mills*, *ibid.* 24 (1943-4), 55-64.

³⁷ *Heatherslaw Mill Guide*, 9-11. Barley simply deprived of its husk in a mill is pot barley or Scotch barley. When the pellicle of the seed is also removed it is called pearl barley. Patent barley is a form obtained by grinding pearl barley.

³⁸ e.g. Heslop, *Northumberland Words* (1893), 2, 344.

³⁹ e.g. *Millstone Rigg, Collier Law* (NZ 003420), where there is a substantial quarry.

⁴⁰ Winch, N. J., *Observations on the Geology of Northumberland and Durham*, *Trans. Geological Soc.* IV pt. 1 (1816), 63-4.

⁴¹ Bailey, J. and Culley, G., *General View of the Agriculture of the County of Northumberland* (3rd ed. 1805), 80.

⁴² NCH VIII (1907), 328, 392. Barnard Castle was an established medieval market so that this is probably no more than a general indication of a source.

⁴³ Beadle, H. L., *Carr Crags Quarry*, *Ind. Arch. Soc. N.E.* 8 (1969), 24-8. (The quarry (NY 918316) could have had a history previous to 1759, v. 42 above).

⁴⁴ NRO, 2DE 16/1/32.

⁴⁵ Fuller, J., *The History of Berwick upon Tweed* (1799), 461.

⁴⁶ NRO, ZRI 27/4/86.

⁴⁷ Tate, op. cit., 454.

⁴⁸ Mackenzie E., *A Descriptive and Historical View of Northumberland* (1825), I, 95; Bailey & Culley, op. cit., 82, 85.

⁴⁹ No information regarding the optimum speed

for local millstones is available, but it has been suggested that blue stones of 4 to 5 ft diameter were normally run in more recent times at 80 to 90 rpm and burrs of 4 ft diameter at 120 to 130 rpm. v. Russell, R., Millstones in Wind and Water Mills, *Trans. Newcomen Soc.* XXXIV (1945), 55-64.

⁵⁰ Text in Hartshorne, C. H., *The History and Antiquities of Northumberland II* (1858), Appendix Mem 12 p. lx.

⁵¹ e.g. *NRO*, EP 54/23 which gives the names of places entitled to use the common quarry in 1862. The surface remains are fairly extensive at NY 832748.

⁵² Wallis, J., *Natural History and Antiquities of Northumberland and Durham* (1769), I, 60; *NRO*, 2285, Corbridge Enclosure Award 1779. The quarry has removed part of the hillfort at NZ 035671.

⁵³ *NCH* XIII, 4.

⁵⁴ Wallis, op. cit., I, 57; Bailey & Culley, op. cit., 20, 23.

⁵⁵ *NCH* III, 7.

⁵⁶ Rickerby, J., The Newcastle Grindstone Industry, *The Quarry and Surveyors and Contractors Journal*, Jan. 1922, 11-16.

⁵⁷ *Encyclopedie ou Dictionnaire Raisonne Des Sciences, Des Arts et Des Metiers*, vol. 10 (1765), 476-7.

⁵⁸ Tucker, D. G., Millstones, Quarries and Millstone Makers, *Post Med. Arch.* 11 (1977), 1-23.

⁵⁹ Sir Frederick Eden referring to Statutes of the Guild at Berwick 1284, v. Fuller, op. cit., 148-9, merely one of a number of local examples.

⁶⁰ Tucker, D. G., Millstones north and south of the Scottish Border, *Ind. Arch. Review* VI, 3 (1982).

⁶¹ Beadle, op. cit., 27.

⁶² Hodgson, op. cit., II, iii, 90 fn., 105.

⁶³ Defoe, D., *A Tour through the Whole Island of Great Britain* (1724-6), III, letter VIII.

⁶⁴ Boldon Book, *Surtees Society* XXV.

⁶⁵ Tynemouth Chartulary, *NCH VIII*, 226, 320.

⁶⁶ Tate, op. cit., 270.

⁶⁷ Fraser, C. M., The Pattern of Trade in NE England, *Northern History* IV (1969), 44-66.

⁶⁸ v. *NCH VIII*, 328.

⁶⁹ Fuller, op. cit., 415; Good's *Directory* (1806), section XVII.

⁷⁰ Tomlinson, W. W., *Comprehensive Guide to Northumberland*, 146.

⁷¹ Welford, R., Alston Manor Paine Roll, *AA*³ VIII (1912), 270. (Possibly in NY 7548).

⁷² Stoyel, op. cit., 22; Beadle, op. cit., 26.

⁷³ *NCH VIII*, 328.

⁷⁴ *Ibid.*, 280-81.

⁷⁵ *NCH IV*, 242.

⁷⁶ e.g. Burne, E. L. (ed.), On Mills by Thomas Telford, *Trans. Newcomen Soc.* XII (1936-7), 205 ff.

⁷⁷ v. *NCH VI*, 252. (Blue stones were often used locally until they were no more than 3 ins. thick).

⁷⁸ Rogers, J. E. T., *A History of Agricultural Prices in England*, vol. I 1259-1400 (1866), 504ff. His methods have been questioned but they suffice for general comparisons.

⁷⁹ Expenditure of the Priory on Holy Island 1381-2 in Raine, J., *History of North Durham* (1852), 110ff.

⁸⁰ Rogers, op. cit., vol. III 1401-1582, 390.

⁸¹ Radley, op. cit., quoting Farey, *Agricultural Derbyshire*.

⁸² e.g. *Millers & Merchants & Farmers' Ready Reckoner* (1861).

⁸³ Tucker, D. G., *Post Med. Arch.* 11 (1977), 13ff.

⁸⁴ e.g. Hardy, J., *Trans Berwick. Nat. Club*, 2 (1843), 62-3; Bailey and Culley, op. cit.; Hodgson, op. cit. II, iii, various.

⁸⁵ Donnachie, I., *A History of the Brewing Industry in Scotland* (1979), 55-6.

⁸⁶ A possibility invoked elsewhere v. Radley, op. cit.

INVENTORY

The numeration is the same as on fig. 1 and in the main text. In addition to the standard abbreviations used in this volume *NRO* refers to documents in the Northumberland Record Office, *OS* to the Ordnance Survey 6" map, 1st ed., *BNC* to the *Trans. Berwickshire Naturalists' Club*, *Hodgson* to Hodgson, J., *History of Northumberland* (1840), and *Wallis* to Wallis, J., *Natural History and Antiquities of Northumberland and Durham* (1769).

1 *Kyloe Wood*; NU 045383; 180 m O.D. As first noted in 1954 the E-W ridge SE of Shepherds Kirk Hill had been completely worked over for millstones; extraction hollows, extraction channels,

and some pecked outlines and rejects were visible. The site is now overplanted and completely overgrown.

2 *Broom Ridge*; NT 968371; 165 m. Rock surfaces carry four peck-marked outlines or roughouts with centre points, c. 4'3" d. (1.3 m), one with a possible "mark of ownership"; there are also some probable extraction hollows. Additional quarrying, some possibly for millstones, occurs on Goats Crag further to the E. First noted 1955.

3 *Doddington North Moor*; NT 994359; 150 m. The whole length of the NW-SE ridge, including the crag face and the tail, has been quarried for a length of c. 275 m and a width of 90 m or more. There has been surface quarrying in the form of extraction hollows and serrated rock edges; deeper workings up to 3 m deep, approached by hollow ways, occur at the tail of the crag. A few unfinished stones are attached to quarry faces and two marking-out grooves are visible on rock surfaces, marked on the OS (1865) as "Sculptured Rock".

At c. NT 990364, on a low ridge further to the NW, there are additional extraction hollows for millstones and other delvings of uncertain nature.

4 *Fenton Plantation*; NU 001340; 110 m. Probable overgrown extraction hollows together with one broken millstone were first noted in 1953. This site had previously been judged to be a possible "native village" from an air-photograph (v. *PSAN*⁴ XI (1947), 153). The area is now partly overplanted and the remainder of the land much improved, so that the traces are less evident.

5 *Lyham Hill*; NU 075310; 210 m. A broad band of extraction hollows and serrated rock edges extends from the E side of the B6349 to beyond Holy Rock about South Lyham, a distance of c. 1 km; remains also include a small number of broken and abandoned millstones and perhaps some quarrying for gateposts. Tenancy in 1563 at 2s p.a., the quarry supplying Glendale, Bamburgshire and Scotland with millstones (Alnwick Mss., *NCH* XIV, 245); 1586 rent at 2s p.a. (*ibid.*, 248-9); 1685 Ralph Muschamp tenant of a quarry, probably the same (*ibid.*). It is not mentioned by *Wallis* in 1769, nor is it shown on estate maps of 1758, 1847, 1850 (*NRO*, ZAN Bell 27/2A, 3, 17, 17A) or on OS (1867).

6 *Amersidelaw Moor*; NU 078270; 210 m. Many overgrown circular extraction hollows for millstones were first noted in 1959, together with some presumptively earlier burial or clearance cairns, but the whole area is now forested.

7 *Millstone Hill, Chatton*; NU 088261; 250 m. A number of extraction hollows and deeper millstone workings lay in the area of the B.A. burial cairns and field-clearance cairns, together with a possible sledge-track (*AA*⁵, IX, 23-43); further surface quarrying probably lay beneath tall heather to the W, but all is now forested. The site appears as Millstone Heugh on a plan of Chatton Park Farm in 1808 (*NRO*, ZAN Bell 27/1(i)) and on OS (1866), but no quarrying is indicated on either.

8 *Hepburn Crag*; NU 075246; 245 m. There are many extraction hollows and intermittent quarrying of the N-S crag face over a distance of c. 225 m, together with a number of abandoned and broken millstones of c. 4'4" d. (1.3 m). First noted in 1959.

9 *Old Bewick*; NU 073216; 215 m. A number of overgrown extraction hollows lie on the plateau above Hanging Crag and to the W of the hillforts on Bewick Hill; further extraction hollows for millstones occur within the hillforts, together with two abandoned millstones, and there are more delvings of uncertain nature to the E. Small but deeper quarries on the NNW slope of Bewick Hill are of uncertain purpose and no millstone workings have been found on the moors across to Blawearie and the Millers Causeway (NU 1022). There was a millstone quarry on Bewick Moor in 1769 (*Wallis*, I, 60), but in 1864 no mention of this is made by MacLauchlan, when one of the extraction hollows in the hillfort is shown, seemingly, as a hut-circle (*Eastern Branch of Watling Street*, 29 and Sheet III). For later speculation v. *BNC* XXII (1912-15), 369.

10 *Harehope Hill*; NU 087205; 190 m. The upper slopes and rocky summit of the hill have been quarried over an area of c. 500 m by 350 m, though much is now grass-grown. The remains consist of circular extraction hollows, worked rock edges and some deeper quarries, all mainly devoted to millstone winning. At least half a dozen broken and one complete millstone of 4' d. (1.2 m) are scattered over the site. The quarrying has been much more extensive and intensive than on Old Bewick Hill(9) and it could be that this is the quarry of good note listed by *Wallis* in 1769; Harehope was at one time part of the manor of Bewick (*NCH* XIV, 420).

11 *Beanley Moor*; NU 0918 and 1018; 120–180 m. Five or more scattered areas of millstone extractions extend over the moor. (i) Corbie Crag to the E. of Beanley Ringses fort carries a band of quarrying for a distance of *c.* 230 m, including marking-out grooves for millstones *c.* 2'5" d. (0.75 m) and *c.* 4'8" d. (1.43 m), together with abandoned millstones of 4'3" d. (1.3 m) and over. (ii) Millstone Heugh, *c.* 100 m to the SE of Ringses fort, has a similar band of quarrying which extends intermittently for a distance of *c.* 250 m and includes some broken millstones and at least one complete stone of 4' 11" d. (1.5 m). (iii) On Beanley Moor, between the Ringses fort and Beanley Plantation fort, are some circular extraction hollows and deeper quarry faces amongst the bracken. (iv) On the edge of Beanley Plantation at *c.* 097180 there has been some surface quarrying, and abandoned millstones lie in thick bracken and beneath the roots of a mature Douglas fir; two smaller areas of quarrying for millstones also lie further to the W. (v) Beanley Plantation fort where extraction hollows were noted to the E of the remains in 1955 but are now overgrown (*cf.* *BNC* (1863–8), 159). In 1320 it was granted to Sir John Lilburn and his tenants to take millstones from the moor for the mill at Shawdon (Woodman Charters no. 26, *AA*³ V 48ff.), but no further references have been found.

12 *Hunterheugh Crags*; NU 117168; 145 m. There has been some quarrying of the N facing rock outcrop beyond the enclosed settlement, where there are abandoned and broken millstones of 4'5" to 4'7" d. (1.35–1.4 m). On rock outcrops within the settlement are two extraction channels for millstones of smaller diameters, *c.* 2'6" and 2'4½" (0.77 and 0.72 m). "Circular channels" were noted in 1952 (*PSAN*⁵ I, 80–81) but not attributed to millstone quarrying.

13 *Jenny's Lantern*; NU 120151; 150 m. Millstones have been extracted in places along the whole length of the SE facing slope and rock outcrops below the hillfort. There are some broken millstones of 4' and up to 5' d. (1.2 to 1.5 m), some extraction channels, one of only 3' d. (0.9 m), and a number of wedge-holes on the rock outcrops. "Circular channels" were noted in 1952 (*PSAN*⁵ I, 80–81) and the nature of the quarry established in 1953.

14 *Corby's Crags*; NU 128102; 180 m. There has been small-scale quarrying on the crags to the E of the B6341 road, not necessarily only for millstones but two broken millstones and one rough-out remain. Further quarrying on the crags to the N of Widehope Letch (NU 125087) is only doubtfully for millstones. First noted in 1954.

15 *Millstone Burn and Millstone Cleugh*; NU 1105. In its earlier forms the latter occurs in the bounds of Rothbury forest as given at the Swainmote Court, Alnwick, in 1539, and also in the proceedings of the Court of Exchequer *re* Edlington Common in 1611 (*v.* *NCH* VII, 136 and 413); both names are on *OS* (1865). Nothing is now visible in the immediate vicinity because of impenetrable afforestation; there are no millstone workings on Caller Crag and only possibilities on Redheugh Crag, but some circular delvings exist by Grey Mare and between here and the Moor House Quarry to the W of Wellhope.

16 *Mount Pleasant*; NU 113030; 245 m. A small amount of quarrying occurs on rock outcrops and there is at least one abandoned millstone of 4'7" d. (1.4 m). Any further quarrying to the N will have been obliterated by afforestation. First noted in 1980.

17 *Little Mill Hill*; NU 078006; 120 m. Two conjoining extraction channels for millstones of 2'10" and 2'7" d. (0.87 and 0.8 m) have been cut on a rock surface above the scarp, *c.* 135 m to the WNW of the enclosed settlement. Some surface quarrying has taken place on top of the escarpment to the W but its purpose is uncertain. The channels were noted in 1867 when their nature was not at first recognized (MacLauchlan, H., *Notes not included in Memoirs on Roman Roads in Northumberland*, 83, and Ms note added by the author to the presentation copy in the Society's library). There was a more extensive millstone quarry somewhere in the area in 1768, "near Rothbury east mill" (*Wallis*, I, 60). In 1663 the Thrum Mill on the N bank of the Coquet was still known as Rothbury East Mill (Dixon, D. D., *Upper Coquetdale*, 426–7) and this lies *c.* 1 km to the NW of Little Mill. There have been a number of quarries in the forested Cragside grounds on the N side of the Coquet.

18 *Old Rothbury*; NU 047020; 190 m. Immediately to the E of Old Rothbury hillfort a prominent rock outcrop bears part of an extraction channel for a millstone of *c.* 4'7" d. (1.4 m) and some later wedge-holes. Quarrying, ostensibly for millstones, extends around this point and for an uncertain distance to the E beneath tall heather. First noted in 1958.

19 *Harbottle Crags*; NT 91804; 275 m. Quarrying for millstones extends along the whole of the

slope above the N shore of Harbottle Lough and well into the present M.o.D. area, as well as less extensively on the slope above the E shore. There are many extraction channels and hollows, deeper quarry faces, and over sixty whole, broken, or attached millstones scattered over the area, most of them measuring 4'7" to 5' d. (1.4–1.5 m). Hollowed ways, probably sledge-tracks, lead down the steep slopes towards Harbottle. In 1604 it was rented for 3s 4d p.a. and the digging of millstones was valued at £10 p.a. (*Survey of Debatable and Border Lands 1604* ed. Sanderson, R. P. (1891), pp. 105, 109, 111); in 1717 it appears in the Register of the Estate of Thomas Selby (*Surtees Soc.*, 131 (1918), 34). Millstones from here were used in local mills for barley processing and the quarry probably ceased to operate in the early nineteenth century (*BNC XII* (1887–9), 42; *AA⁵ x* (1982), 153). Scythe sand and hone stones were also obtained from the same area (*NCH XV*, 8).

20 *Long Crag*; NT 917043; 210 m. There has been some quarrying for millstones on the crag above Linsheels Lake, where there are also three broken millstones (v. also *AA⁵ X* (1982), 153). Further possible workings exist on Barrow Hill (NT 901044) and J. Philipson reports an abandoned millstone by a probable sledge-track in the vicinity.

21 *Byrness Hill*; NT 774033; 390 m. There are possible extraction hollows on the hill top and more beneath the bracken on the S facing slope of the crags. Two roughouts for millstones lie on the SW slope; another is still attached to a rock outcrop, together with two well cut vertical extractions, on the S facing crag named Millstone Crag on *OS* (1866).

22 *Millstone Crag, Rigg and Syke*; NY 6892; 365 m. These features are now completely engulfed in the Kielder-Wainhope forest. John Proudlock, one-time shepherd in the area, recalled seeing partly cut millstones in the Millstone Crag area before afforestation. It was possibly no more than a minor local exploitation for a now ruined mill S of Plashetts colliery or that on the Belling Burn (*AA⁵ V*, 129–33).

23 *Millstone Edge*; NY 862902; 350 m. A broad band of surface quarrying extends along the ridge for a distance of c. 175 m, but there is nothing to relate this specifically to millstone winning except the name which appears on *OS* (1865) and not thereafter. (The stone bearing the name of the shepherd's house at Hareshaw Head is a grindstone.)

24 *Peterstone Flow*; NY 976916; 300 m. Surface quarrying of a small rock outcrop about 90 m long, together with two roughly cut millstones of c. 5' d. (1.5 m) were noted in 1955, before more recent extensions to the forest. The site lay near the bounds of the allotment to Whisker Shields and Whisker Shields Mill in the 1805 Elsdon Common Enclosure Allotment (*NRO, QRD 3*), and may have been a minimal development of a not very suitable source.

25 *Crag Shield*; NY 808774; 195 m. Part of an extraction channel of c. 2'4" d. (0.72 m), presumably for a millstone rather than a grindstone, remains on a broken rock surface. Shallow delvings of uncertain purpose lie within the area of the adjacent enclosed settlement and there is a more recent deep quarry for building stone on the N. A drawing of the "inscribed stone", dated 1864, and a plan of the settlement has been added by MacLauchlan to the presentation copy of his *Notes* (v. Little Mill(17) above); this plan shows no quarry to the N.

26 *Tecket*; NY 8672. Despite search and enquiry "the rock cut into millstone form, but abandoned because of hardness" (*Wallis*, I, 60) has not been found. There are some old quarries on the south bank of the burn but these were probably for building stone. *Wallis* was curate at Simonburn for some years and it is reasonable to assume that he would have recorded any extensive quarrying for millstones. The worn millstone in the farmhouse garden appears to be of granite.

27 *Gunnerton Quarries*; NY 7592. *Bulmer's Directory* of 1886 states that the manufacture of millstones and grindstones was carried on by Messrs' Steel and Turner of Edinburgh (pp. 527, 535), but it is not clear if any millstones were obtained from this source. (This large firm of quarrymasters and colliery owners, at that time of 2 Torphichen Street, Edinburgh, also worked Crag Quarry at Corsenside.)

Similar doubt must be attached to the possible origin of a pair of stones abandoned in the extensive Prudhamstone Quarries, near Fourstones (NY 885688), where some pulpstones appear to have been quarried.

28 *Watch Hill, Broomhouses*; NY 703623; 180 m. A broad band of quarrying extends for c. 400 m diagonally up the hillslope on both sides of a burn; it includes both surface and deeper quarrying.

The main production has been large millstones of 4'6" to 5'3" d. (1.4–1.6 m), of which there are many abandoned examples and some marking-out grooves. Some small handmills have also been extracted and perhaps some gateposts. The quarry extends from Bellister into Plenmeller township, where "all the stone quarries" were given a yearly value of £3 6s 8d in 1613, and in 1667 a marriage grant mentions "milnestones" belonging to the manor of Bellister (*Hodgson*, II, iii, 346). By 1840 the moors of Plenmeller had been "formerly much resorted to for millstones" (*ibid*, 343). The quarry is no more than a topographical feature in Award no. 8 of the Enclosure of Plenmeller Common in 1865 (*NRO*) and is marked as an old millstone quarry on *OS* (1866). Hodgson's suggested derivation of Plenmeller from "miller" or "millstone" is interesting but probably fanciful (v. Mawer. A., *Place Names of Northumberland and Durham* (1920), 158).

29 *Millstone Plantation, Burnfoot*; NY 683619; 135 m. Overgrown workings up to 3.5 m deep, accompanied by a short hollow way, lie beneath the remains of a plantation named Millstone Plantation on *OS* (1865) but now nameless. This is undoubtedly the quarry recorded in 1769 as being on the W side of the "Blalack Burn", near Wydon Eals, where millstones were obtained from "a stratum 9 ft. thick below 9 ft. of rubbish," where the master quarrier paid the proprietor £1 10s for every pair of millstones obtained, and from whence some were conveyed into remote parts of Scotland (*Wallis*, I, 60). The burn is marked as the Park Burn on the present *OS* although it was referred to as the "Blalack Burn" by the farmer at Burnfoot some years ago. The quarry must have been abandoned well before 1865, and possibly before 1840 (v. no. 30 below).

30 *Chapel, West Coanwood/Asholme*; NY 6858 and 6958. In 1840 "the last millstone quarry that was open in this parish (i.e. Haltwhistle) was in West Coanwood, at a place called the Chapel, which is now a public house" (*Hodgson*, II, iii, 352, 359). "Conewood Chapel" appears on Saxton's map of 1576, Speed's map of 1610, and Armstrong's map of 1769, and generally would seem to have been in the vicinity of Asholme. The 1802 Division of Asholme Common (*NRO*, 691/1/14/3) gives three quarries, their purpose not specified except for one freestone quarry. In 1828 there was an "excellent millstone quarry on the manor of Asholme", Robson and Hutchinson being the proprietors (Parson and White, *Directory of Northumberland 1828*, II, 600). Later Directories give no further references to the quarry but in 1855, as it happens, one Thos. Robson is listed as a victualler at the Chapel, Asholme, and one John Hutchinson as a yeoman (Whellan's *Directory 1855*). Earlier in the present century there was a public house in Asholme, "The Sportsman", now a private dwelling. Unfortunately at present this has not been confirmed as the former site of the Chapel. The two nearest of five quarries in the area are on the opposite side of the road from Asholme at NY 687583 and 688581, but neither now provide certain evidence of millstone winning.

31 *Whitfield Lough*; NY 716555–723543; 485 m. Intermittent stretches of surface quarrying for millstones and two deeper linear quarries occur over a distance of 1.4 km. There are many complete, unfinished, or broken millstones, the majority being between 4'6" and 4'9" d. (1.4–1.5 m), and there has also been some quarrying for gateposts and building stone in the deeper quarries. In 1769 there was "millstone quarry of good esteem near a lake or lough" (*Wallis*, I, 60; as late as 1840 Whitfield Lough was still nameless). The quarry is not mentioned by Hodgson in 1840, nor in Knarsdale Common Enclosure of 1859, though the Millstone Band receives notice (*NRO*, ZMD 44/2), and an estate mineralogical map of 1863 shows nothing by the lough (*NRO*, Zmd 44/10). A stone-built quarrymen's cabin, the ruins of which are still visible in the northernmost deeper quarry, is shown on *OS* (1865) together with faint indications of this quarry, but it seems unlikely that millstones were still being produced at this date.

32 *Milnstones and Millstone Syke, Whitfield*; Ny 7651. Millstone Syke, a tributary of Whitewalls Burn, appears on *OS* (1866). Milnstones was one of four holdings granted to Francis Whitfield in 1607, the others being Over Ouston (NY 777529), White Walls (NY 779524) and Nether Potterhouse (? Netherhouse on the Mohope Burn), and there are legal suits relating to all four in 1630 (*NRO*, WI/12; *Hodgson*, II, iii, 112 fn. p). Small areas of quarrying occur spasmodically near Millstone Syke and the Carriers Way up to c. 480 m., but none are convincing as sources for millstones. At c. NY 765517, however, below a small crag and waterfall, there is a well robbed steading and the crags hereabouts have certainly been quarried for gateposts, of which a dozen or more lie abandoned. Could this also be Milnstones, the location of which has not yet been established?

33 *Shield Croft, Hexham*; NY 944634; 120 m. The evidence is no more than circumstantial, parts of millstones having been recovered from Shield Croft farm (*info.* M. Snape) which is almost adjacent to one of a number of quarries on the grits of what was Hexham East Common (*v.* Inclosure Award, 1755, *NRO* and Ridley, G. W., *AA*⁵ II (1974), 213–23).

34 *Corbridge Fell*; NY 985624; 150 m. Quarrying for one purpose or another extends for up to 200 m W of the present road, formerly Millstone Quarry Road. A small area of quarrying also exists further to the W at NY 982625. In 1304 an agreement gave rights to take millstones for Dilston Mill (Alnwick Ms., *NCH* X, 79 fn.3); in 1532 the reeve of Corbridge accounted for the rent of a quarry of “grindstones” in Snokoe (*ibid.*, 133; Snokoe Hill lies immediately to the W); in 1663 Clarke’s survey includes mention of a millstone quarry (*ibid.*); and in 1779 the Enclosure Award includes a millstone quarry allotment of 1a. 4p. located as above and approached by the “Millstone Quarry Road” (*NRO*, 2285; *v.* also Dixon, S. F., *Corbridge: The Saxon Royal Town* (1912), 140ff.). By 1846 the quarry was used for stone for the High Level Bridge and was subsequently referred to as the High Level Quarry, the proprietors then being Hughes and Sons (*NRO*, PC 57/158). In 1887 ownership was vested in Dixon and Son, millstone and grindstone manufacturers, also of Gateshead (*Bulmer’s Directory 1887*, 465).

35 *Bearl, Bywell*; NZ 054641; 120 m. The present quarry, leased to the Natural Stone Co., is on the site of a wider area of quarrying to the W of Bearl, probably worked from medieval times. In 1525–6 a millstone quarry was leased in Bywell for 13s 4d p.a. (Rental for the Earl of Westmorland’s Lordship, *AA*² I (1857), 134) and for the same rent in 1570 (Leasehold tenants in Bywell, *NCH* VI, 91). The present quarry at Bearl was operating in 1886 for freestone and as a manufactory of millstones and grindstones under G. and G. V. Foreman (Patterson and Son) of Newcastle (*Bulmer’s Directory 1886*, 415). It continued to produce millstones, grindstones and pulpstones until the Second World War, according to Mr Tweddle of Bearl who worked as a carrier at the quarry from 1927–52 and delivered millstones by road to cornmills as far distant as Darlington to the S and Kelso to the N.

36 *Slaley*; NY 9757. Areas of Millstone Grit to the S of Slaley are extensively forested and the absence of more specific locations in documentary sources has hindered field recognition of millstone quarries. In 1278 a charter *re* Slaley mill allowed the seeking of millstones in the area (Greenwell Deeds, *AA*⁴ III (1927), 30 no. 60; *NCH* VI, 350); the Preston Subsidy Roll of 1296 included cartage of millstones from Slaley to mills within the Liberty of Tynemouth (*NCH* VIII, 343). Millstone quarries are not mentioned in the 1608 Survey or in the records of the improvement of Slaley Moor between 1659 and 1687 (*NCH* VI, 383). The Bulbeck Common Enclosure Award lists 23 quarries but none are specifically attributed to millstone working (*NRO*, QRD/3, 4; QRA/9). The nineteenth-century Directories mention only ochre being obtained from Slaley Fell (e.g. Parson and White *Directory 1828*, II 128), though there are general references to millstones being quarried in the area of the Derwent.

37 *Millstone Hill and Minsteracres*; NZ 020540; 275 m. Shallow surface delvings and some deeper quarry pits extend for a distance of at least 350 m overall to the E and W of the road at School House, some 1.3 km S of Minsteracres. Much of this could have been for stone walls, but the name of the hill on *OS* (1865) and some large blocks of Millstone Grit in the field-walls also point to millstone quarrying. Minsteracres itself appears in different forms over the centuries e.g. Mynstaneacres 1268, Milnestoneacres 1347, Minstrakers 1663, and Mawer (*op. cit.*, 143) suggests the meaning “millstone fields”. The Rev. Lenders (*Minsteracres* (1932)) states that an abandoned millstone would have been sufficient to account for the name, but he ignores the presence of the Millstone Grit and Millstone Hill.

38, 39 *Newcastle and Gateshead*. There is no comprehensive treatment of the Newcastle grindstone industry, although by the 15th century it was making an important contribution to the wealth of the area, and when the Newcastle Hostmen were incorporated it was not only for the loading and better disposition of sea-coals and pit-coals but also of “grindstones, rub-stones and whetstones”. The industry was said to be producing 100,000 stones a year in 1863 (Bruce, J. W., *Handbook to Newcastle on Tyne* (1863), 271). The extent to which the many quarries on the north and south sides of the Tyne could have been producing vertical runners for shelling barley etc. has not been explored. The site of the quarry at Elswick, from which presumably some millstones could be obtained in 1337 (*v.* *NCH*

XIII, 239) was conceivably that which was close to Elswick Mill and the line of the Roman Vallum, as portrayed in Henry Richardson's water colour of 1848 (*ibid.*, pl. 4, 520).

*After the inventory was compiled an additional millstone quarry was noted on the northern Fell Sandstones near to Berryhull, NT 938403, and, as it happens, *c.* 1 km to the ENE of Barleymill Bank above the River Till.

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