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“Limekilns in Scotland”

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The Society publishes a wide range of books and booklets on historic OS map series and its journal, *Sheetlines*, is recognised internationally for its specialist articles on Ordnance Survey-related topics.

## ***Further comment on OS mapping of limekilns in Scotland***

***Paul Bishop and David Munro***<sup>1</sup>

A recent note in *Sheetlines* explored the mapping of limekilns on OS first and second edition maps of the Central Belt of Scotland.<sup>2</sup> Part of that exploration involved compiling the symbols used in OS mapping, including examining the antecedents to the limekiln mapping symbols used in Scotland. Bishop and Thompson also speculated on the extent to which symbols used for the mapping of draw kilns were an attempt to represent the on-the-ground structure of kilns and, in particular, of draw kilns. Recent work shedding light on these matters is reported here.

Lime is produced by burning (calcining) limestone ( $\text{CaCO}_3$ ) to a temperature of at least  $900^\circ\text{C}$  in a kiln.<sup>3</sup> The limekilns mapped in Scotland on OS first edition mapping were represented by at least 35 different symbols.<sup>4</sup> This apparently large number of symbols is in fact easily simplified into two broad classes representing one or other of the two classes of kiln types, namely, simple clamp kilns – three-sided U-shaped or rectangular pits or embayments into which the limestone and fuel were packed and burned – and more elaborate draw kilns in which a stone-built structure encloses an internal kiln ‘pot’ or pots. Limestone and fuel were loaded into the draw kiln pot from a platform at the top and the resultant lime was drawn off at the base of the pot.



*Figure 1. John Birrell's 1796 survey of the lands on the Eastside of Kinnesswood, showing the boundary between the arable runrig lands (lower third of the map) and the fore brae of the Bishop Hill to the north. Note the line of six U-shaped kiln symbols above the rigs. Also visible is the word 'Row' between dotted lines. The Row is where limestone was rolled down to the kilns from the Fairy Doors Quarry at the top of the brae.*

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<sup>2</sup> Paul Bishop and Gavin Thompson, 'How OS depicted limekilns in Scotland's Central Belt', *Sheetlines* 98 (2013), 19-31.

<sup>3</sup> For more detail see *ibid.*

<sup>4</sup> Bishop and Thompson, *figure 3*.

David Johnson, the leading historian of lime-burning in Yorkshire,<sup>5</sup> noted in a 12 July 2011 email to PB: “Only one of your [limekiln] symbols appears on English OS first edition mapping. I have never come across the others you found.” The apparent lack of unequivocal symbols for clamp kilns in the Old Series Ordnance Survey maps of England and Wales<sup>6</sup> is consistent with Johnson’s comment, and it may be that Scotland has a richer range of mapping symbols for limekilns. We hope that this present note and its predecessor prompt some comment from CCS members on OS mapping of limekilns in England.

Our examination of pre-first edition OS maps and estate plans suggests that there may in fact have been a different and perhaps stronger tradition of limekiln mapping in Scotland than in England. U-shaped symbols labelled ‘Kill’ on an ?1805 farm plan of the ‘Long Fauld’ limeworks<sup>7</sup> – ‘kill’ being a Scots word for kiln – confirm the pre-OS use of the U-shaped symbol for a limekiln. The tradition of mapping clamp kilns with a U symbol (a tradition that Johnson’s comment above suggests may be lacking in mapping of limekilns in England) is now extended further back in time in Scotland by John Birrell’s 1796 survey of the lands on the Eastside of Kinnesswood in Kinross (*figure 1*).<sup>8</sup>

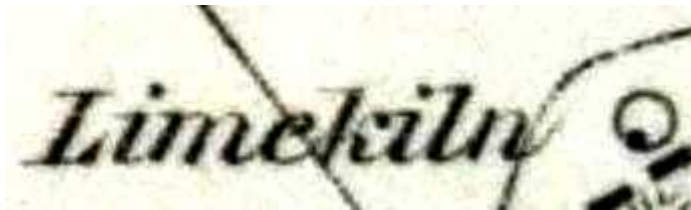


Figure 2A. Draw kiln at Nobleston (Dumbartonshire, first edition six-inch sheet XVIII)



Figure 2B. Draw kiln at Cults Lime Works, Pitlessie, as mapped on Fife, sheet 17, and as imaged by Google Earth [©Google. ©Getmapping plc]

The limekiln symbol recognised by Johnson from OS mapping of limekilns in England is a circle with a black dot at one point on the circle’s circumference. Bishop and Thompson speculated that the dot may indicate the position of the kiln’s draw hole<sup>9</sup> but this is now less clear (see below). This symbol is also found in the Old Series Ordnance Survey maps of England and Wales,<sup>10</sup> as well as on OS first edition six-inch mapping of Ireland, published 1833-46,<sup>11</sup> and corresponds

<sup>5</sup> D Johnson, *Limestone Industries of the Yorkshire Dales*. 2nd ed., Stroud: Amberley, 2010.

<sup>6</sup> Bishop and Thompson, *op. cit.*

<sup>7</sup> Bishop and Thompson, *figure 1*.

<sup>8</sup> John Birrell’s 1796 *Survey of the Lands on the Eastside of Kinnesswood*, Kinross (Marshall) Museum.

<sup>9</sup> Bishop and Thompson, *op. cit.*

<sup>10</sup> See Bishop and Thompson, *figure 4F*.

<sup>11</sup> *Pers. comm.* Richard Oliver, September 1, 2014.

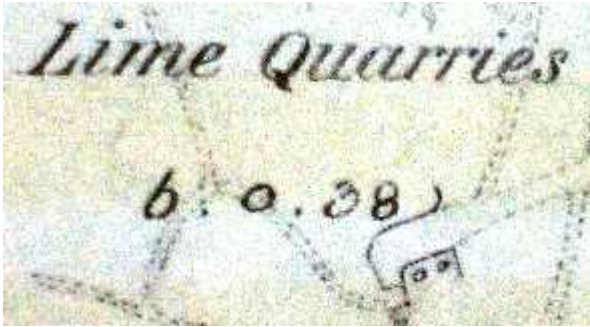


Figure 2C: Extract from sheet 21 of the 1856 McCallum & Dundas survey of the Queensberry Estate (RHP 38148/24). The pots of two draw kilns and their surrounding masonry are at bottom right. This area was surveyed by OS in 1859 for the Lanarkshire first edition six-inch sheet XLVI and 25-inch sheet XLVI.5. Both sheets show a rectangular structure labelled “Kiln” in the overall setting of the “Whitecleuch Lime Works”, but neither shows kiln pots. The 25-inch representation of the kiln shows two enigmatic ?lean-to structures on the front of the kiln in the work area.

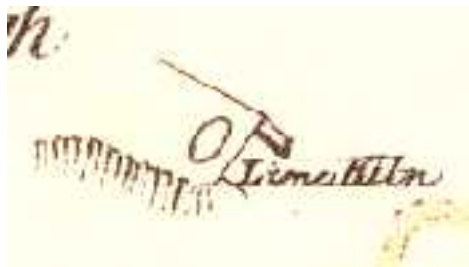


Figure 3. Draw kiln at Auchencloigh Farm, Ayrshire, showing an oval kiln pot in a masonry structure. [Ayr first edition 25-inch sheet VII.08 (Kilbirnie)]

to one of the two symbols used in Scotland to map draw kilns (*figure 2A*). A second main symbol used to map draw kilns is more pictographic in style, with a circle representing the kiln pot and a surrounding polygon that indicates the edges of the masonry structure that encases and supports the pot (*figure 2B*). A variant of this symbol may also have been used in the Old Series maps<sup>12</sup> but that Old Series symbol is slightly more complex than that used in Scotland.

As in the case of the U-shaped symbol for mapping clamp kilns, this second, more pictographic symbol for mapping a draw kiln has precursors in kiln mapping on Scottish farm plans. The mapping of limeworks on the Duneaton Water in Crawfordjohn Parish on the Queensberry Estate in 1856 clearly indicates a pair of draw kiln pots within their surrounding and supporting masonry and set into a backing slope. An access road and work area is located in front (to the north) of the kiln (*figure 2C*).

This pictographic approach, in which the mapping moves from either symbolic representation of the mapped object or representation only of the object’s outline in plan view (ie, representation of the object’s ‘footprint’) to pictorial representation of the object’s form or morphology may have been developed even further in mapping of limekilns in Scotland. Speculation that the wings flanking the ‘Lime Kiln’ label in *figure 3* were structural features<sup>13</sup> is now confirmed after inspection of the remains of this kiln. The ovoid kiln pot is likewise confirmed by field observation, which also revealed that both flanks of the kiln are embanked. It is noteworthy that the mapped symbol in *figure 3* does not represent the embanking of both sides of the kiln. Moreover, the mapped representation of the wings

<sup>12</sup> *Pers. comm.* Richard Oliver, September 1, 2014.

<sup>13</sup> Bishop and Thompson, *op. cit.*

can be interpreted as depicting the inner and end faces of the upper (northeastern) wing, while showing only the upper edge of the inner face of the lower (southwestern) wing. Both the slope hachuring of the SW flank of the kiln and the thick line marking the inner and end faces of the upper wing, and the lack of slope hachuring on the kiln's NE flank plus the simple representation of the lower wing's inner upper edge, are all consistent with an attempt to provide a perspective representation of the kiln's three-dimensional morphology, albeit simply and somewhat primitively.

As in all map representations, the mapping of the Auchencloigh kiln remains nonetheless symbolic. The dimensions of the kiln elements, including the long-axis length of the ovoid kiln pot, and the spacing of the wings, are greater on the

mapped symbol than on the ground. The issue of legibility of the symbol versus the true size of the object represented by the symbol is not a new one – think of the width of a mapped road versus its true width – but it is perhaps thrown into sharper relief when the mapped symbol is attempting to represent the mapped object more pictorially, as is suggested here for the

Auchencloigh kiln.

As noted above, it was speculated in the earlier note that the dot on the circumference of the circle symbol for a draw kiln indicates the position of the kiln draw hole (*figure 2A*). The mapping of two banks of draw kilns in Dumfries and Galloway – at the Guett and Craig-dullyear limeworks, to the northeast of New Cumnock (*figure 4*) – suggests that this interpretation is unlikely.



*Figure 4.*

*A (top): The draw kilns of the Guett limeworks on OS first edition 25-inch mapping (top left) and six-inch mapping (top right).*

*B (middle right): Google Earth image of the Guett kilns [©Google. ©Getmapping plc]*

*C (bottom): The draw kilns of the Craigdullyear limeworks on OS first edition 25-inch mapping (bottom left) and six-inch mapping (bottom right).*

*In both A and C, 25-inch mapping is from Ayr sheet XLII.3 (New Cumnock) (survey date: 1857; publication date: 1860), and six-inch mapping is from Ayrshire, sheet XLII (survey date: 1857; publication date: 1860)*

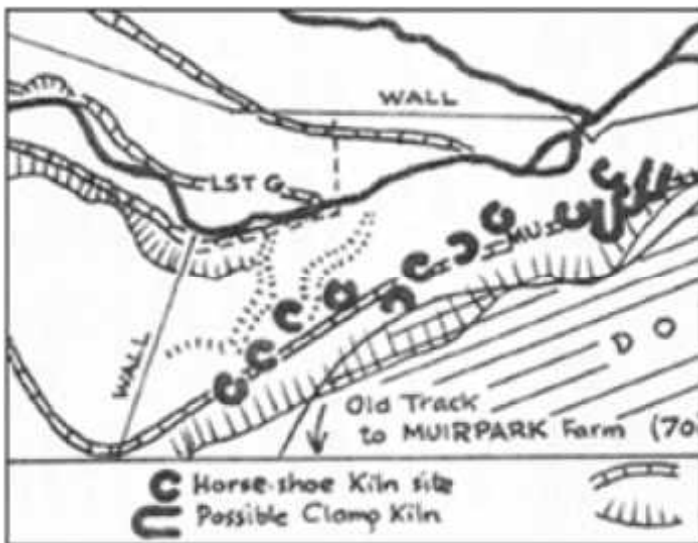
The six-inch mapping of the Guett limeworks (*figure 4A*) uses the circle-with-dot symbol for each of the two draw kilns, with the dot on the southwestern edge of each circle. The 25-inch mapping for the same structures confirms, however, that the kilns' draw holes must have been on their northern side, with the straight edge of the kiln masonry structure facing onto the kiln work area where the quick lime would have been drawn. The roadway that approaches the kiln pots from the south was an access road up a ramp to the top of the kilns from where the pots would have been loaded. Field inspection and the shadow cast to the north on the Google Earth image of the remains of the Guett draw kilns (*figure 4B*) confirm that the northern face fronted onto a work area at the base of the kilns and that the draw holes are on this northern face of the kiln structure. Field inspection also confirms that access to the kiln top for loading was by a ramp up from the south. It now seems clear that the dot on the circumference of the circle marking a draw kiln may have no significance in terms of the position of the draw hole.

The mapping of the Craigdullyeart kilns (*figure 4C*) likewise confirms that they are draw kilns, with loading roads to their tops. Field checking confirms that a work area with draw holes is on the kiln's southeast face, which is indicated by straight line in the mapped kiln structure. Interestingly, the six-inch mapping symbols of the Guett and Craigdullyeart draw kilns are different (circle with dot for Guett; simple circle for Craigdullyeart). Both limeworks are mapped on the same six-inch sheet and it remains unclear why the OS mapper (or engraver) used different symbols for the two sets of draw kilns that the 25-inch mapping (and field checking) indicate are similar. This observation means that it may be impossible to infer kiln type from mapping symbol, beyond the simplest inference of draw kiln versus clamp kiln.

In conclusion, we make the following observations, on which we would welcome comments from CCS members, in particular concerning the mapping of limekilns in England:

1. OS mapping of limekilns in Scotland distinguished clamp kilns and draw kilns
2. The practice of using a U-shaped symbol for clamp kilns might be restricted to Scotland, where such use predated OS's mid-nineteenth century first edition mapping by at least 50 years
3. Early OS mapping in Scotland drew on existing symbology in use by farm and estate surveyors and cartographers, perhaps implying a close link between OS and such farm and estate surveyors and cartographers
4. It seems that OS first edition mapping of limekilns in Scotland may have included attempts at crude three-dimensional pictographic representation of draw kilns
5. An earlier suggestion that the position of the circumferential dot on the circle-with-dot symbol for a draw kiln indicates the position of the draw-hole is not confirmed by the use of this symbol in mapping the Guett limeworks kilns.

One final point: other possible symbols to map lime kilns include horseshoe-shaped symbols for open-circle-shaped (less elongate) clamp kilns. Such horseshoe-shaped clamp morphology is obvious in abandoned kilns (*figure 5A*) and has been used (and distinguished from U-shaped clamp kilns) in recent non-OS mapping of long-abandoned clamp kilns in upper Bannockburn (*figure 5B*). The more circular horseshoe symbol has so far not been encountered in OS mapping, suggesting that OS surveyors in Scotland chose not to go to that level of detail in mapping clamp kilns.



*Figure 5.*

*A (above): Adjacent clamp kilns on Blairskaith Muir, Baldernock in East Dunbartonshire. Note the contrast between the elongate U-shape of the left-hand kiln and the more circular horseshoe-shape on the right*

*B (left): McKay's mapping of Bannockburn clamp kilns,<sup>14</sup> distinguishing the U-shaped clamp kiln morphology (centre right) from the more horseshoe-shaped morphology*

*The Ordnance Survey map extracts are taken from <http://maps.nls.uk> by kind permission of National Library of Scotland.*

<sup>14</sup> KJH Mackay, 'Limestone working. A forgotten Stirlingshire industry', *Forth Naturalist and Historian* 2 (1977), 80-105.