

NEWSLETTER NUMBER 5 – November 2020 Edited by Anne Taylor

Themes for this newsletter are **kilns, mines, railways and navvies**. Many thanks to the contributors: members Margaret Gowling, Keith Jagger, and Raynor Shaw, and non member Sue Haywood. **There are still a number of well-preserved lime kilns in our area, see photo below.** It would be good to make a permanent record of all that exist – with photographs and grid references in the first instance, then more detail and some society trips in the summer. Members could make a start now, and take advantage of any remaining good weather. Email images and references to me, Anne Taylor at at241@cam.ac.uk 01786371518



Lime Kiln, near Blasterfield Farm, along the B6260 between Appleby and Orton, photo Keith Jagger

LIME KILNS AND QUARRIES
Raynor Shaw and Anne Taylor

Lime kilns, in different forms, have been a feature of the British landscape for almost two millennia. Burning (or calcining) limestone, which is essentially calcium carbonate (CaCO_3) with a small percentage of impurities such as silica (quartz sand), produces calcium oxide (CaO), commonly known as quicklime. Throughout history, calcined limestone has had a wide variety of uses, ranging from mortar to whitewash and fertiliser. In the case of fertiliser, when mixed with water the quicklime produces slaked lime, calcium hydroxide, that is rapidly absorbed by agricultural soils. This contrasts with crushed limestone, which is not only time-consuming and labour-intensive to produce, at least before mechanisation, but particulate lime takes a long time to break down in the soil and so is not easily absorbed.

Lime burning in Britain has been traced back to at least Roman times when quicklime was mixed with sand to make mortar for stone buildings,

although some was used to offset ‘sourness’ in agricultural soils. The Romans used simple ‘clamp kilns’ that consisted of an earthen bank with an entrance. Limestone and fuel were layered to form a dome. The edifice was then ignited before being covered with sods or earth. Absolute dating of clamp kilns has shown that many were active between the early 2nd century to the late 4th century, although the type was in use until the 1850s.

Former clamp kiln sites are generally difficult to identify, surviving only as a pit about 2.5 m in diameter and 2 m deep, perhaps with surrounding piles of loose rock. Archaeological excavations have shown that the adjacent soil commonly exhibits distinctive colour changes that are evidence of intense heating. Johnson noted (see sources over page, 2013): *Pendragon Castle in Mallerstang has a well-preserved earthwork that has not been excavated but looks suspiciously like a sow kiln [clamp kiln]; given its fine state of preservation, it is more likely to date from Lady Anne’s renovation of the castle 1661 to 1662 rather than from its initial medieval construction in stone.*

Anglo Saxon buildings were mostly constructed of wood. Hence lime mortar was not in demand, although lime whitewash was used on the more important buildings. In contrast, the medieval period (1066 to 1485) witnessed the construction of stone castles, city walls and churches that revived the demand for lime mortar.

During the 16th century, agricultural improvements led to the increasing use of lime as a fertiliser, along with crop rotations and the spreading of manure. Liming increased in scale during the 18th century ‘agricultural revolution’. Such were the improvements gained by liming that, in 1887, William Morley Eggleston wrote: “prior to cultivation this piece of land was worth £4 10s *per annum*, whilst after liming and draining it was worth £24 *per annum*.”

Before the age of canals and railways that could transport bulk commodities such as fertiliser, most farms or agricultural communities produced their own slaked lime. Local stone, or in some cases brick, was used to build lime kilns in the fields. They were set into hill slopes close to limestone outcrops. Quarried limestone was broken into manageable lumps, then alternating layers of limestone and coal were fed into the top of the kiln, and lit from the ‘eye’ below. The

contents would slowly burn at around 900° C for 4 or 5 days, after which the quicklime was raked out from the 'eye', loaded onto carts, and transported to the fields. Manure was usually mixed with the quicklime before the mixture was deposited on the land.

With the arrival of the canals, and later the railways, slaked lime and other bulk commodities could be cheaply and conveniently transported to agricultural regions of Britain that lacked their own limestone outcrops. Limestone burning therefore became more centralised and increasingly industrialised. Here in the northwest, the extension of the Preston-Lancaster Canal to Kendal by 1819 not only allowed Kendal to import cheaper coal from the Lancashire coalfields, but also enabled the export of vast quantities of limestone, both as building stone and for liming, to 'sweeten' the Lancashire fields. The dominant cargoes of the narrow boats on this route earned the canal the title of 'The Black and White Canal'.

Numerous examples of carefully constructed field kilns, in various states of preservation, can still be seen dotted around Upper Eden (see map on previous page). Although no longer used, they constitute an important component of British cultural history.

Sources:

Limekilns of the North Pennines, Alastair Roberston, 1999, North Pennines Heritage Trust

Lime Burning, Graham Brooks
<https://www.cumbria-industries.org.uk/a-z-of-industries/lime-burning/>

Historic England: Pre-industrial Lime Kilns
<https://historicengland.org.uk/images-books/publications/iha-preindustrial-lime-kilns/heag222-pre-industrial-lime-kilns/>

Lime Burning and the Uses of Lime in the Historic County of Westmorland and Along the Pennine Edge, David S Johnson, 2013, in *CWAAS Transactions*, Vol 13, pp191-214
https://cumbriapast.com/cwaas/download/628286a9/tcwaas_003_2013_vol13_0015.pdf



REMINDER

Upper Eden History Society **Open Archives**, at The Cloisters, Kirkby Stephen, 10.00 to 12.00, the first Saturday of every month.

Saturday 7 November

Theme: **Lime Kilns, Railways and Navvies**
and a month later, on

Saturday 5 December

Theme: **Clay pipes and other local finds**

Both Saturdays – books, photographs and copies of relevant articles on display. Please visit us, browse and say hello.



LOANIN END poem by Sue Haywood



Ruined engine shed
Loanin End, Swaledale

Loanin End – world's end.
Look close, a rough construct of stone,
hostage to the harsh winters of these uplands.
200 years ago a noisy thriving mill,
powered by water
to lift the leadstone
from the deep bowels of the earth.

The shaft, 150ft, falls to watery depths
down which men toiled,
now host to green moss and ferns,
covered by heavy metal pipes
to guard against unwary sheep.

Times past
this mill supported 300 souls
or thereabouts,
who lived in Birkdale hamlet, now defunct.
For times have changed
and the mineral wealth, lead,
sought since Roman times, and later
for export overseas,
now is no more.

The land, divested of its forest trees,
once rich with game, reverts to pasturage for
sheep,
supporting but a fraction of the populace once
served.
Is this another sign of the despoiling of the planet
– our only home?

