

Bell Lime Kiln

Draw kiln.

Built c1860s

Used (intermittently) until 1918

Grade II listed 19 December 1984

Images of England number 400677

Images 1990



Poking Hole

Draw Hole

Pointed Draw Arch, stone lined

The poking and draw holes were filled in after an animal had fallen in to the pot c1940.



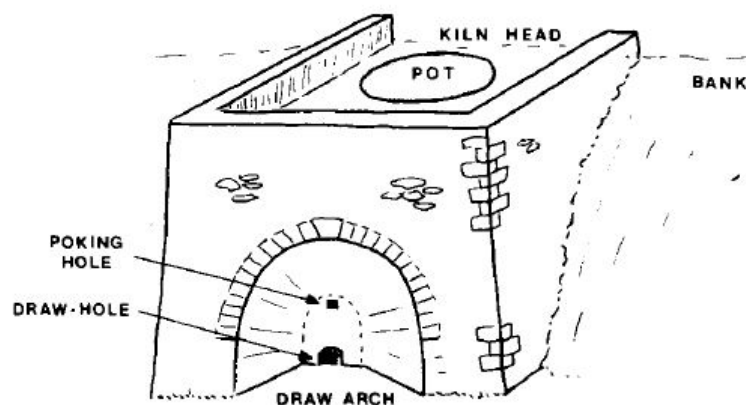
Kiln head with retaining Wall 1992



Brick lined pot 1992

Figure I shows the features of a 'typical' Dorset draw kiln, built into a bank with protective wall around the top or kiln head. Construction was of stone, with thick insulating walls. The shape of the brick-lined pot (charging hole, well or burning cone) was like an inverted bottle, round with vertical sides tapering towards the base where there was an iron grate or grill. The main feature was a single draw arch (access arch) in the front wall. It opened into a recess or lobby which narrowed towards the back wall where the draw-hole (eye) provided the draught to the kiln and the means for drawing out the burnt lime. Above the draw-hole, poking holes were small square openings through which an iron rod (bar) was inserted to test the extent of burning and loosen the charge should it become stuck.

It was common for a lime shed to be attached to the front of the kiln, covering the draw arch and giving protection from the wind and rain to the working area where the burnt lime was being handled.



PHS

Figure 1. Features of a typical Dorset draw-kiln of the nineteenth century.

Reference; Peter Stanier, 'Dorset Limekilns: a first survey', *Proceedings of the Dorset Natural History and Archaeological Society*, vol 115, 1993, pp33-49

Working practice

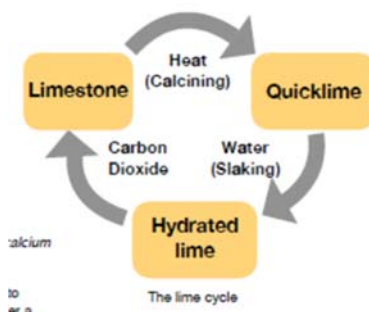
The limestone or chalk was delivered by cart or barrow to the kiln head, where it was broken down by sledge hammer to fist-sized pieces before being tipped into the pot. One side of the kiln head, or an area close by, was reserved for storing the fuel, which was mostly culm or slack coal.

To light a kiln, sticks and culm were first placed on the grate or bars at the bottom of the pot, then a barrow-load of stones, followed by another layer of culm and two loads of stone. The kiln was then lit and once it had taken, more stones were added. Charging continued, using a wheelbarrow to tip in alternate layers of fuel and stone in the usual proportions of one to four until the kiln was full. It was important to have voids between the stones, for the even distribution of heat and to allow the escape of carbon dioxide ('carbonic acid').

Lime-burning for agriculture

The earlier agricultural writers and improvers considered lime to be a manure, which was used alongside chalk and marl. Chalk and marl (a clayey decomposed form of chalk) were commonly dug from pits which are still a feature of some chalk landscapes. (Marl pits at Spinney Kot formerly Lousy Knapp, Loders – Tithe Map 1846)

The chemical process of lime-burning is shown below. During the burning or calcining of calcium carbonate at 900°C or above, carbon dioxide is released (dissociation). The limestone or chalk will yield about half its own weight in quicklime, which is a pure form of calcium. This reacts violently with water to form slaked or hydrated lime, which is over a hundred times as soluble as limestone.



Calcium is one of the most important constituents of soil. It neutralises soil acidity (even chalk soils can become acid), and thus encourages the action of useful bacteria which render fertilisers and other nutrients available for plant growth, and it improves and alters the texture of the soil.

Other uses of lime

Before the advent of Portland and other cements, lime was used extensively for building, where mortar was produced by the addition of slaked lime to sand. It continued to be sold to the building trade in the twentieth century.

For the Dorset cottager, lime ash was used for laying hard floors, an improvement on beaten earth. White-wash was made from lime and whiting. Victorian public utilities sought lime, for example, for softening water.

Emergency repairs 2009 & 2017



You could see through the walls!



Infill being removed to prevent the outer walls being pushed out further



West wall leaning outwards



Aerial view of repairs 2017. Barn owl box erected as there were barn owls using the kiln in the 1960s



Inside of pot
Grate





Drone views; S J Willmott

Water ingress into the walls had washed away the fox mould infill and the lime mortar had failed. Portland cement had been used in the past to make repairs.

The fill between the inner pot and outer structure was saturated and forced the outer walls apart. Straps retained the walls while repairs were carried out. Some larger local stones were used to bind the walls together. Further repairs are currently being carried out to return the top to level and complete replacing missing stones and pointing.

Photos inside the pot.



