



## Lime burning factsheet

### Kilns

The aim of lime burning is to produce quicklime from chalk or limestone, which are forms of calcium carbonate. The earliest known lime kiln in Britain dates back to Roman times. Initially lime was made in temporary pit or clamp kilns; permanent kilns built of masonry became common in more recent centuries as demand for buildings and agriculture grew. A typical kiln would take the form of large pot into which chalk and fuel were piled in layers and then fired; the resulting quicklime was drawn off from below. East Anglian kilns were distinctive structures, with circular access chambers and vaulted roofs.



Inside a disused Norfolk limekiln, showing vaulted, brick-built construction and central column with extraction chute descending from the firing pot above.

### The uses of lime

Lime has been used for making mortar, plaster and paint. It is also used today for making medicines and paper-making, and for water purification and effluent treatment. Mortar is made by mixing lime putty with sand and water. Agricultural lime, often known as marl, is spread on fields to neutralise acid, sandy soils, and to help break down clayey soils.

## The Norwich lime industry

Chalk rock of Cretaceous age outcrops in the Norwich area, where the Rivers Wensum and Yare have cut down through younger rocks to reveal underlying beds. Chalk is close to the surface along the valley sides. Where space allowed, big chalk pits were opened up at Carrow, Eaton, Thorpe St Andrew and Whitlingham; it was sometimes cheaper, particularly where space was at a premium in built-up areas, to dig extraction tunnels. In fact the ground under the city is

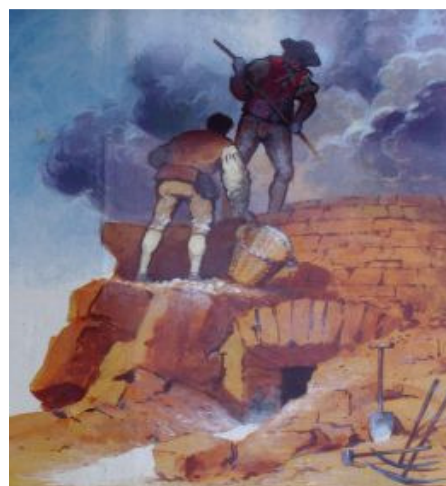


The Dell, a big disused chalk pit at Thorpe St Andrew; now a woodland nature reserve

honeycombed with old tunnels which sometimes collapse. Many people will remember the incident in 1988 when a bus plunged into a deep hole in Earlham Road. Two hundred years ago wherries loaded with lime were a common sight on the R. Wensum, calling in at staithes along the river bank.

*“The distance between Wood-Bastwick and the marlpits at Thorp next Norwich, is not by land, more than six or seven miles; yet the farmers find it cheaper to fetch their marl fifty miles by water, and then carry it, perhaps half a mile from the staith to the ground, than fetch it these six or seven miles by land”.*

Extract from ‘The Rural Economy of Norfolk’ by William Marshall, 1795.



Lime burners at work, from ‘Microcosm’ by WH Pyne, 1808

## The chemistry

The raw material is calcium carbonate which is roasted at a temperature of over 900°C, and carbon dioxide is driven off leaving calcium oxide (quicklime) behind. This quicklime is chemically unstable in the presence of water, and when mixed with water (slaked) it gives off heat and turns into calcium hydroxide. The resulting slaked lime putty is ready for use, although it may first be stored and left to ripen for a while.

## Find out more

- Read ‘Limekilns and Limeburning’ by Richard Williams (Shire Publications; 2004).
- See Chalk East website from more information about Chalk in the East Anglian landscape [http://www.geo-east.org.uk/special\\_projects/index.htm](http://www.geo-east.org.uk/special_projects/index.htm).

## The lime burning event at Whitlingham

- Download an event information leaflet from [http://www.geoeast.org.uk/geoimap/norfpdf/lime\\_burn\\_flier.pdf](http://www.geoeast.org.uk/geoimap/norfpdf/lime_burn_flier.pdf).
- The demonstration lime burning project is funded by Natural England and the Geologists Association, and promoted by the Norfolk Geodiversity Partnership and Whitlingham Charitable Trust in association with Chalk East.