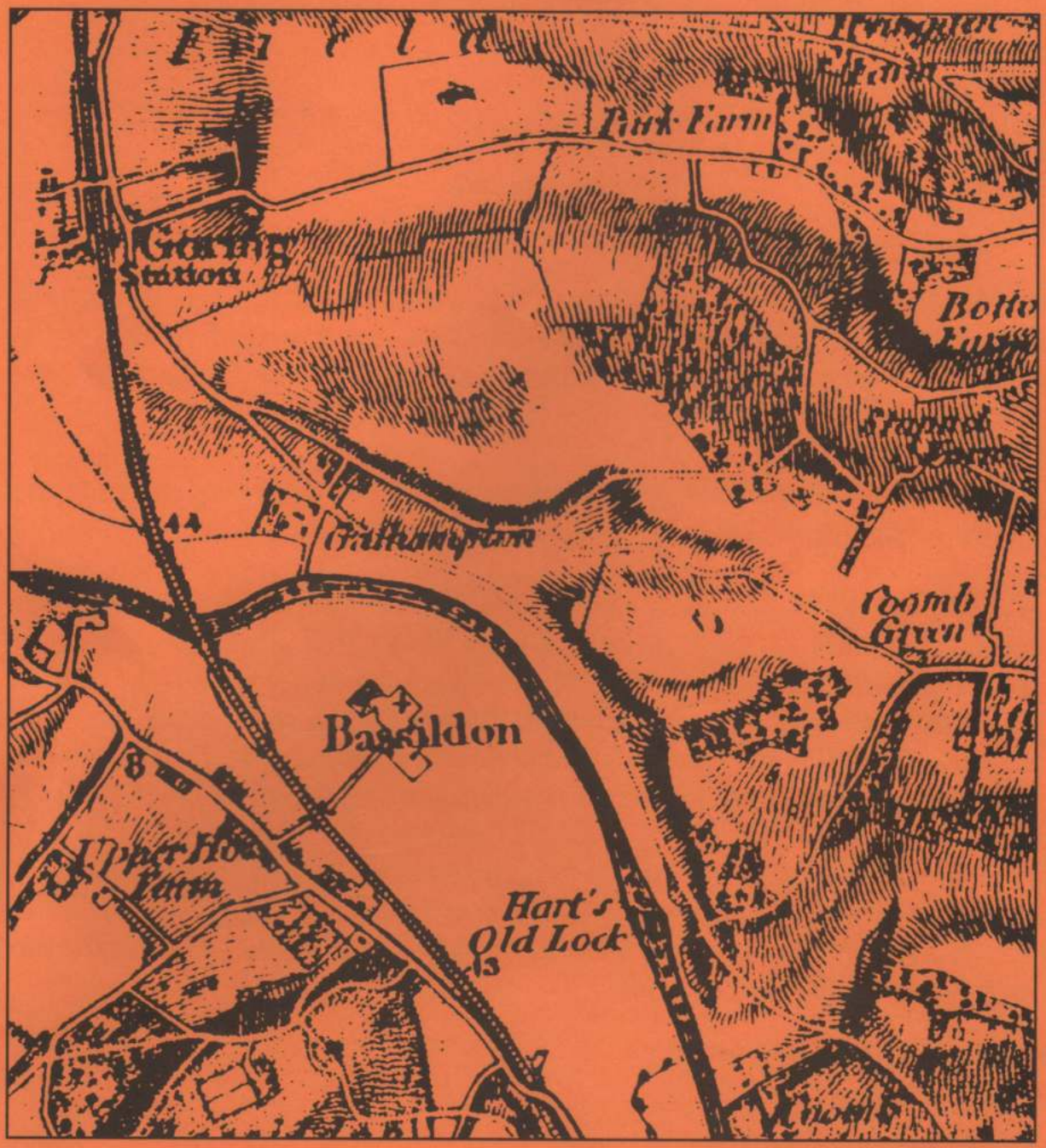
The Origins Of Two Ancient Chalk Quarries At Gatehampton, Goring-on-Thames, Oxfordshire.



Occasional paper No 1 by Trevor Coombs. February 1996.
South Oxfordshire Archæological Group (SOAG).

Price £2.50

Introduction

It was Marion Fallowfield's article in SOAG's 1993 Annual Bulletin in which she traced medieval landowners in Gt. Chalk Wood and Hartslock Wood Goring which drew my attention to the curious landscape feature of the 500 metre 'woodway.'

I have done additional work to discover the most likely origin and period of use of this long ditch and bank.

Not far away, three quarters of a mile to the south, exists an obvious quarry right on the river bank of the Thames at a place where Hart's Lock used to be. It occurred to me that there was a tradition of quarrying in this part of Oxfordshire and there might be a connection between the two sites. It so happened there was no connection between the two sites but what I found out about each has been fascinating. My thoughts and conclusions may be found in the following pages.

I am grateful to Marian Fallowfield for getting me started and wish to thank Ron Bridle of Goring for typographical direction and Elizabeth Leggatt of The Centre For Oxfordshire Studies. Without the aid of these three people I doubt if I would have published the booklet at all.

Trevor Coombs,
Goring January 1996.

The Origins Of Two Ancient Chalk Quarries

At Gatehampton & Hartslock, Goring.

by

Trevor Coombs

12, Milldown Road, Goring Oxon RG8 0BA

Published By South Oxfordshire Archaeological Group

February 1996

This paper attempts to establish the origin and periods of use of two ancient chalk quarries, one in Great Chalk Wood, the other on Thames bank at Hartslock Wood opposite the Beale Wild Life Park.

The History Of Chalk In Lime Making.

Chalk as the raw material in building work has a long history. The Romans burned it to make lime mortar, concrete and plaster for their villas, town centres and city walls. English medieval kings raised demand for chalk to new heights when they started their building spree of castles, palaces and charitable buildings.

A new use for lime as the magic ingredient for crop fertility started about 1500 when it was discovered that wheat yields increased dramatically after top dressing the soil. In places like Devon and Cornwall with no chalk of their own, lime kiln owners took barge loads of chalk from South Wales, 40 miles across the Severn Estuary. They beached the boats on the Devon seashore and had them unloaded by local women who piled the chalk lumps on quays adjacent to the lime kilns. Appledore was one of the main ports for this trade. Devon farmers would arrive with their own carts, often sleeping overnight in their carts and vie with each other to be the first to get loaded and be away to lime their fields. Life was tough in rural areas in the 16th century whether you were male or female.

One can see many of the disused lime kilns standing in west coast harbours and coves today. The artist, J W M Turner, visited many harbours along the southern coasts of England and at Combe Martin in 1824 painted a water colour of the lime kiln on the harbour quay. Now in the Ashmolean Museum, Oxford.

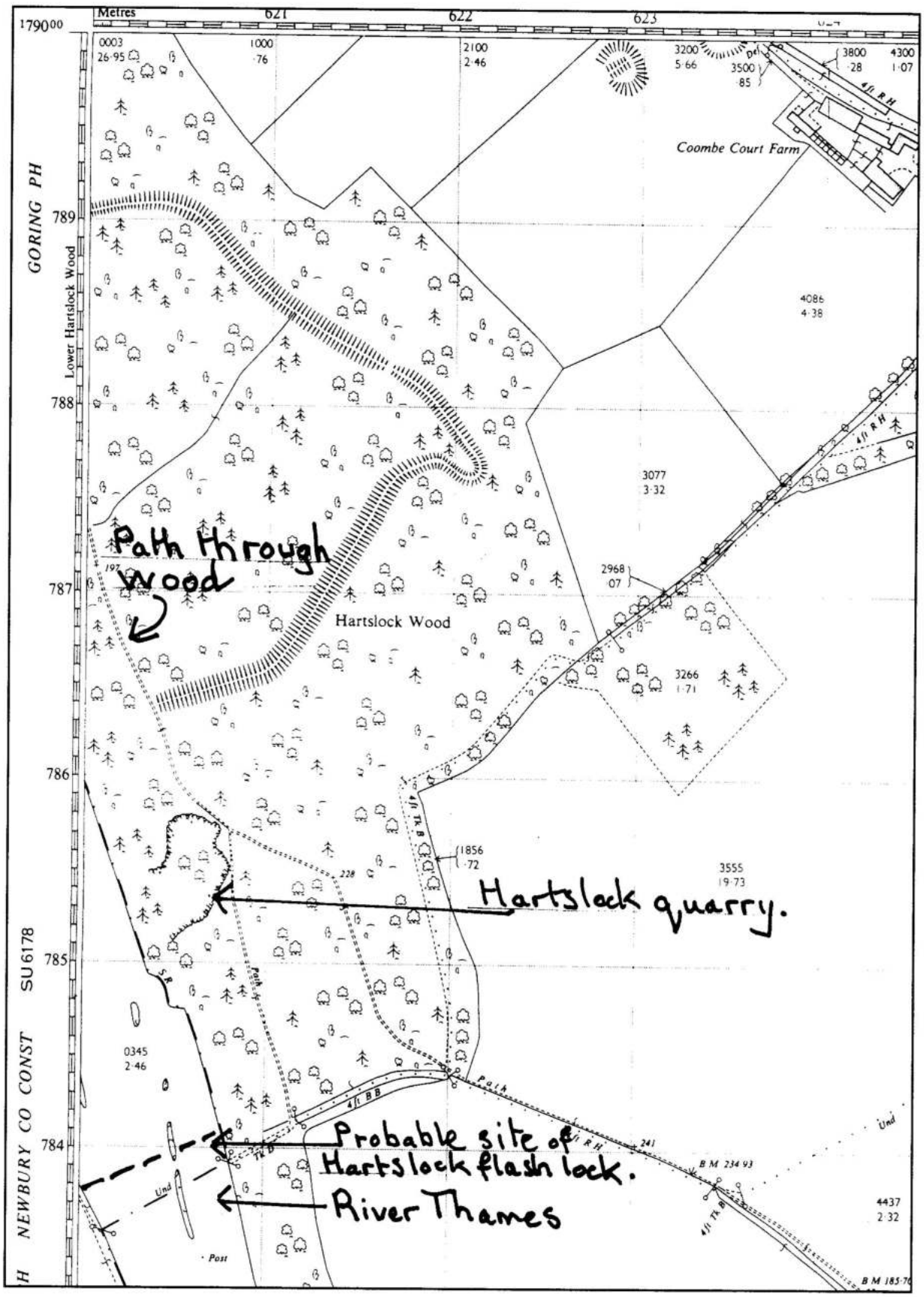
The Chemistry Of Lime Making

Lumps of chalk and coal (or wood) are laid down in alternate layers inside a lime kiln and are burned at 1000 degrees C for 36 hours. Carbon Dioxide is driven off as a gas to leave calcium oxide (CaO), known as quicklime. When water is added to quicklime it makes slaked lime (Ca OH)2 and with excess of water, it makes lime putty. Lime putty, when mixed with water and sand makes mortar for building work. The slaked lime was also used by farmers to neutralise acidic soil from 1500 onwards. Quicklime was sometimes used as a defensive weapon by filling glass spherical beakers full of lime and throwing it down from castle ramparts (cf.Durham Castle siege).

The Riverside Chalk Quarry At Hartslock Wood, O S map 175 621785.

This quarry is large. It has a floor area of 1680 sq. metres and a depth of 20 metres at the back of the quarry. Taking the escarpment gradient into account, approximately 16,000 to 17,000 cubic metres have been excavated (one cu metre is equivalent to one tonne of chalk in the ground).

Since Hartslock quarry is sited right on the bank, it is fair to assume that chalk was only taken away by river barge. Along the 140 mile length of the Thames, accessible chalk only occurs between Pangbourne and Goring.



© Crown Copyright 25 inch to 1 mile Ordnance Survey map showing Hartslock Quarry 1951
(O S 1 to 50 000 map 175 ref: 621785)

The chalk escarpment, where barges could tie up directly by a quarry, is only one mile long. Thus chalk for barge transport was confined to less than 1% of the length of the Thames. We are fortunate to have a contemporary document confirming the existence of Hartslock quarry in 1251. It is mentioned in an agreement between owner and tenant made between Fulco Cowdray (owner) with the Prioress of Goring nunnery in 1251. The latter was granted exclusive rights to agricultural use on the escarpement except use of the fulling mill, fish weir and quarry. Apparently in 1251 the fish weir at Hartslock needed repairs and Fulco reserved the right to use 'stones' from his quarry on the river bank.(Salter H.E. Boarstall Cartulary 1251. Oxford History Society 1930, page 64). He might have used up to 300 cubic metres of chalk on the repair work so there is a further 16,000 cubic metres to account for.

Long before our piped water supply arrived, a private dam across the river supplied its owner with water for fish weirs, milling and watering cattle. The temptation for landowners to install a dam and derive a great asset for very little cost was hard to resist. However, the asset was not enjoyed by others. As early as 1215 the English barons were so concerned about lack of passage rights on the Thames they put the following passage in the Magna Carta, 'All fish weirs shall be entirely removed from the Thames and the Medway and throughout England except upon the sea shore' (Line 36, Magna Carta). Shortly after 1270 the number of complaints about the Thames being blocked with weirs for catching fish, or any other use, rose substantially. In an effort to appease barge owners, kings published decrees and parliament prepared 'Actes' to say the weirs were to be dismantled. Unfortunately the king's noble inspectors lacked determination and nothing was achieved.

Here are a few of the early acts of parliament and complaints: 1274 Act of Edward III, 'The water of the Thames was to be so widened that ships and great barges might ascend from London to Oxford'. In 1294 Edward I appointed William de Bereford 'to inspect the weirs as divers lords had erected them in fresh places'. In 1305, barge owners complained to the king 'that magnates and others have made mills, weirs and divers enclosures without licence and built them higher so that fish and ships cannot pass'. A petition was made to parliament in 1348 that weirs were completely blocking the Thames. By 1350 an act by Edward the III was ' made to have weirs out and utterly pulled down'. And so on for the next 400 years! (Thacker,The General History of the Thames). A practical effect of the obstructions was in 1456 when Henry VI was building Eton College with stone quarried at Taynton near Burford. The stone was carted from Burford to Henley and then delivered by barge to Windsor. The normal route was by cart to Lechlade and then by barge all the way to Windsor.

So from the late thirteenth century onwards the Thames was over endowed with flash locks in the weirs which were both dangerous and expensive. Boatmen complained of the expense, the delays and the sinking of their boats in the rush of water created by flash locks. However, before 1260 barge traffic thrived on the Thames because early medieval kings assumed they owned the river and kept the route open with four water bailiffs who had the Royal Court to ensure their word was paramount. As an example of royal autocracy, king John in 1205 granted the right to William, son of Andrew, 'that he might have one ship going and returning between Oxford and London free of toll with permission to load his ship wherever he wished on the Thames'.So a contractor to the king was running his family business of barge transport without paying flash lock fees, wharfage or tolls.

By 1251 the quarry had been excavated by approximately 16,000 cubic metres, We are therefore looking for several large users of chalk who could deliver it by barge to Oxford,Wallingford and Reading. Henry III is a likely candidate. In 1229 he was busy repairing Oxford's castle and city

wall. Arthur Raistrick in his book 'Industrial Archaeology, Methuen 1972' quotes a chronicle as follows, 'as at Oxford in 1229 the king allowed 26 acres of timber for the two kilns made for repairing the castle'.

In 1231, 'the timber was brought from Reading and those through whose lands it was due to pass were warned not to impede its passage to Oxford'. (History of the king's works, vol 1, page 158, HMSO 1962). In 1234 timber came by barge from Reading to Oxford ordered by Henry III for the hospital of St John at Oxford. (Hist of the kings works p.720). The city wall at Oxford was 'thoroughly overhauled' between 1226 and 1240 and the king gave firewood for the two lime kilns used to make the mortar and for hurdle platforms for workmen to use as scaffolds during the repairs. The timber came from royal forests at Brill, Shotover and by barge from Reading. (Hassall,T.G. Oxford city walls, VCH, Oxon vol IV, 1979). As the barges from Reading would have passed within a few metres of Hartslock quarry, what better place to pick up the chalk than at Hartslock and deliver it on the same barge with its timber fuel to the lime kilns on the quayside at Oxford. It certainly made economic sense.

By 1260 however, Henry's water bailiffs were fighting a losing battle with the landowners and their weirs. By that time Thames barge traffic decreased to a minimum and did not revive until the Thames Commissioners ordered pound locks to replace the flash locks in the last quarter of the eighteenth century.

Clearing the Thames of weirs was an epic trial of strength between vested interests and the nation's parliament. Serious attempts to remove obstructions began in 1606 with an 'Acte for clearing the passage by water from London to Oxford. Eighteen years later (1624) parliament focussed attention on the upper Thames. They passed an 'Acte for the making of the river Thames navigable for barges, boats and lighters from Bercot vnto the vniversitie and citie of Oxford'.In 1695 parliament produced 'an Acte to prevent extractions by the occupiers of locks' followed by orders for specific sites. One hundred years later (1794), parliament commissioned a report, 'A comparative view of Thames and canal navigation'. Perhaps the last of the ineffective acts was an act of 1750 'for the better carrying and regulating navigation on the Thames'. The first act to have any teeth was in 1751 when Thames commissioners were appointed with real power. Commissioners were authorised to make and aquire towpaths, to purchase compulsorily the old flash locks and destroy them. It was the commissioners who wrote the subsequent act of 1770 which fixed dimensions for the new pound locks by depth of water, length and width. By the 1780s pound locks appeared with official keepers charged with attending all day and letting barges pass without delay. However all was not solved, There remained the crafty millers to complicate matters. Goring and Cleeve pound locks were both opened in 1787. Both mill owners managed to get their own employees to be the official keepers. Not suprisingly the keepers 'went missing' and on busy days at the mills, the locks did not open. The water had been diverted to the mills.

It was in the last forty years of the eighteenth century that canals started to have a devastating effect on the transport costs of bulk cargoes. Coal, iron ore and chalk prices were savagely attacked by the canal owners with the price for transporting chalk reduced to one fifth of the 1750 price. (The canal builders by Anthony Burton, p.213, David and Charles 1972).

In conclusion, Hartslock quarry needed customers who had their lime kilns adjacent to the Thames sometime between 1100 and 1260. Possible customers could have been the builders: of Reading Abbey (Henry I between 1110 and 1121); Wallingford Castle where Henry III's brother, Richard, Earl of Cornwall spent large sums of money putting up the third concentric wall and a

new Great Hall between 1218 and 1220 or Oxford Castle and city wall refurbishment combined with the building of the Hospital of St John and Beaumont Palace between 1226 and 1240. The most likely customer was Henry III at Oxford since he had the largest requirement for lime mortar and was transporting his fuel for the kilns from Reading by barge. The second most likely customer was the king's brother, Richard (the richest man in Britain at the time) who did much refurbishment to Wallingford Castle in the 1220's. Thirdly, Henry I could have been a customer since he finished Reading Abbey in 1121.

The Quarry On The Edge Of Great Chalkwood, O S map 175 624796

Not many people are aware that this curious feature of the landscape, a 500 metre long by 12 metre wide ditch with an earth bank along one side is a special type of chalk quarry. It starts near Stapnell's Farm, forms the S.E. edge of Great Chalk wood and then protrudes from the wood for a length of 300 metres. It is now covered in trees up to 120 years old and with some rotting trunks which have lain on the ground for some 50 years. The depth of the trench is 1.5 metres and is best approached from Stapnell's Farm.

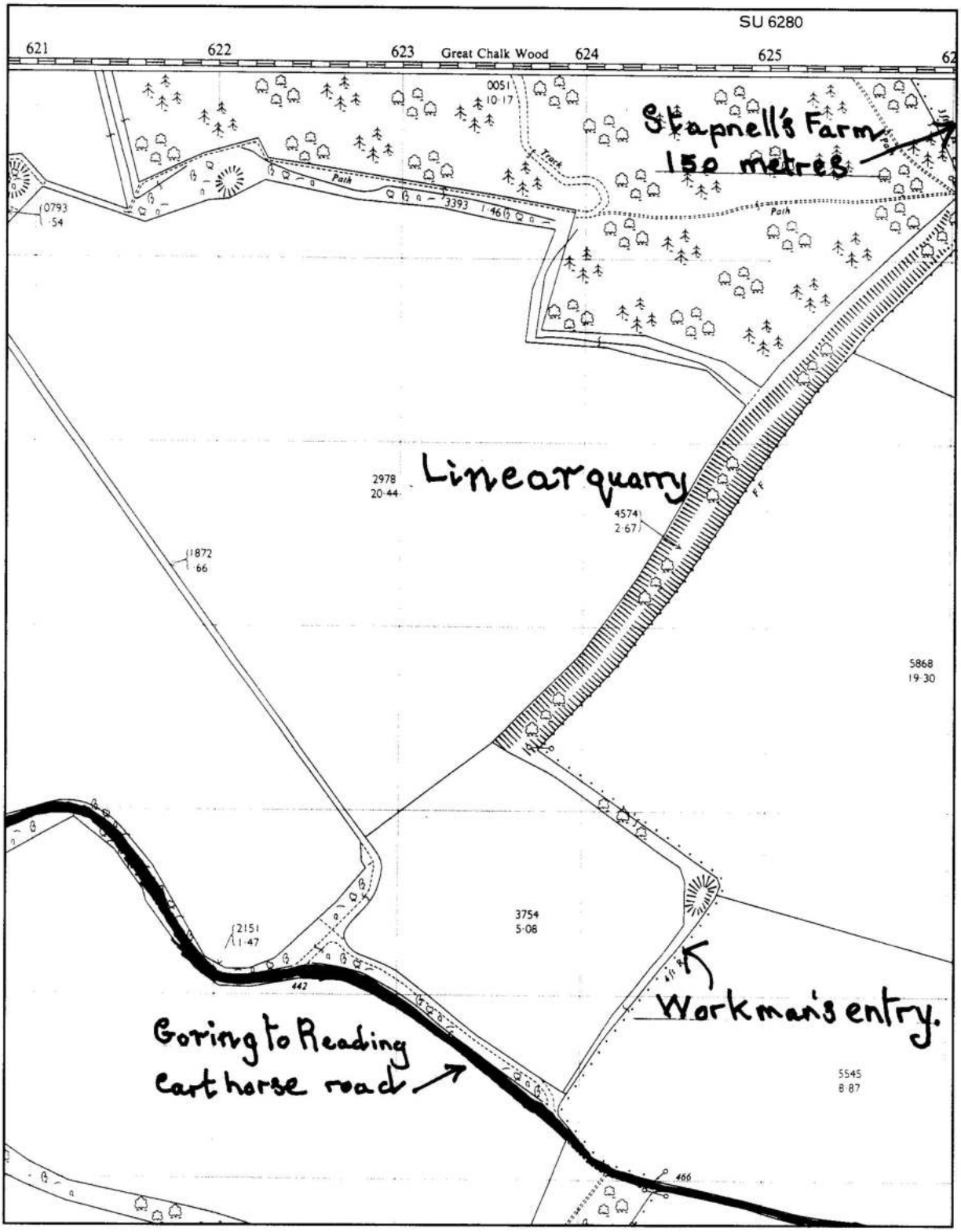
What Possible Uses Could This Earthwork Have Had?

It has been suggested that the ditch was a 'woodway' caused by woodsmen dragging tree trunks by horses lifting up one end on wheels and trailing the other end on the woodland floor. They would have been extracting the logs from the woodland on their way to a sawmill. It could not have been this since the trench does not lead to a saw pit and the earth is banked up on one side of the ditch. A woodway has earth piled up on both sides. It might have been a woodland boundary. It is unlikely to be this because woodland boundaries were only two metres across and boundary earth banks were on the woodland inside, not as this one is, on the wood's outside edge.

There is also a possibility that it could have been a medieval deer park ditch which once had a fence on the top to retain deer. There is no record of a deer park in Great Chalk Wood and to make this idea even less likely, the workmen who constructed the ditch obtained access by a 'workman's path' which connected to the Goring to Reading horse carriage road. This road starts at the BBONT reserve at Gatehampton and winds up between the hills on its way to Reading.

The most likely explanation for the earth work is that it was once a linear quarry. Linear quarries were attractive commercial propositions for extracting minerals which had only a thin top soil above them. This quarry has a top soil depth of 14 ins. In all probability the owners would have had wooden rails, wooden wheels (invented in the early seventeenth century by wood turners) and wooden tubs pulled by mules to get the chalk out to the nearest road.

The volume of chalk extracted from the quarry is approximately 7,000 cubic metres more or less 7,000 tonnes. Assuming a 17 or 18 century working year to be about 305 working days and that one man was expected to dig two cubic metres of chalk per day, then the quarry had a working life of about 12 years if run by two men. Since the site has the attributes of a slow but steady supply (narrow work face and difficult exits for the chalk) it is a strong possibility that lime kilns were on the site and only slaked lime was carried to local farmers. Even on chalk farmland it is necessary to lime the land since it washes out over time. It is also attractive to think that the adjacent woodland could have provided the necessary fuel.



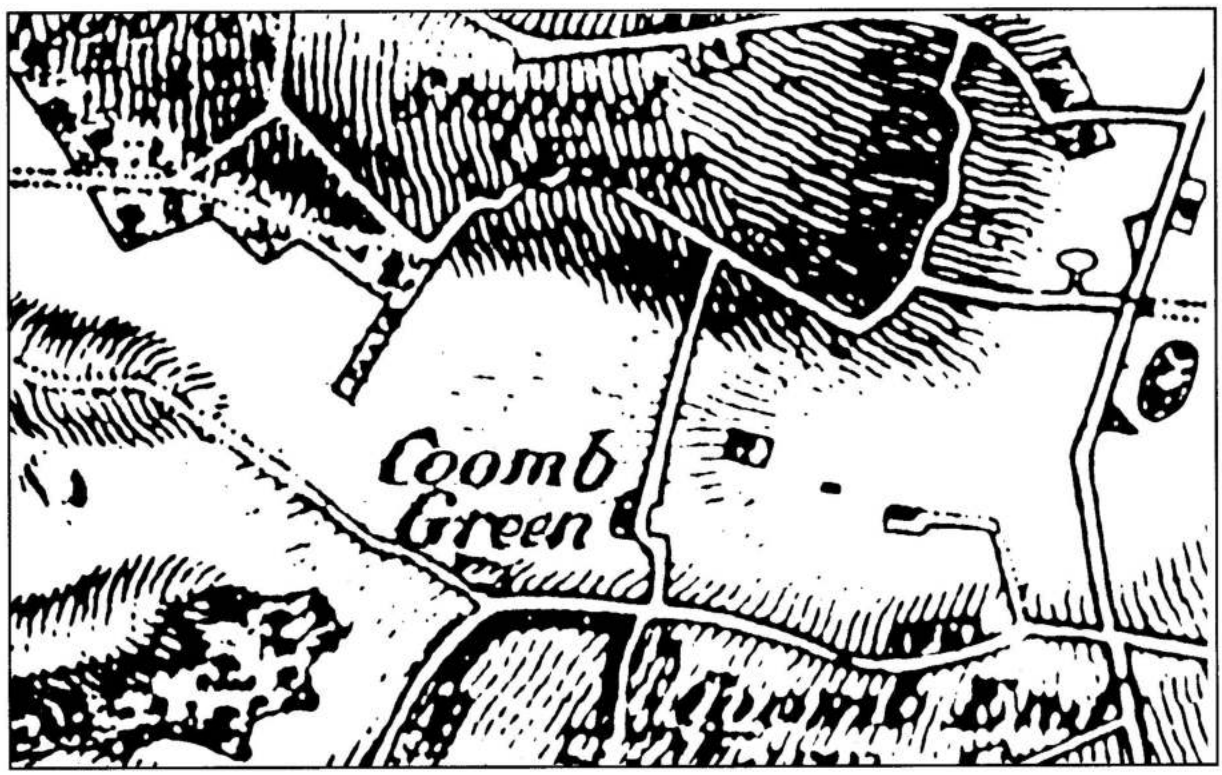
© Crown Copyright 25 inch to 1 mile Ordnance Survey Map showing the linear quarry on the edge of Great Chalk Wood (O S 1 to 50,000 map 175 ref: 624796).

Is There Other Evidence For This Being A Man Made Ditch?

Fortunately there is. The first Ordnance Survey map published in 1830 made a feature of the ditch protruding 300 metres from Great Chalk Wood (see front cover). The survey for the map was done in 1809 and 1810 and study of the one inch scale shows the feature which has illegible symbols on it. However if the map is enlarged five times, one can read the symbols as hachures on the left hand side indicating a ditch and small triangles on the right hand side indicating the bank. There are no tree symbols on the site as are shown for Great Chalk Wood. This indicates there was no tree regeneration when the surveyors visited in 1810. The Enclosure Award map of 1812 simply ignores the site. Apparently no one was interested in claiming a 500 metre long bare chalk ditch and bank despite the allocation of even smaller parcels of land to specific owners in the schedule of the Enclosure Award.

What Are The Most Likely Dates For This Linear Quarry?

The earliest wooden railways were from about 1620 and enabled the quarry owner to avoid the expense of hole-in-the-ground quarries which required a man and a horse to haul the chalk to the surface. In a linear quarry, workmen could fill the tubs as soon as they had uncovered the chalk and a willing horse could be urged to pull the tub by himself. By 1780 chalk quarries needed to be near a canal if they were to compete on price. c.f. the price of transported lime falling to a fifth of its 1750 price by 1800. To achieve this price reduction, canal owners had built lime kilns all along the side of some of their canals. The Montgomeryshire Canal, Powys was started in 1796 and by 1821 had kilns more or less every mile along its length. They became even more frequent as time went on.



© Crown Copyright Ordnance Survey 1 inch to 1 mile map Oxfordshire sheet 13 Surveyed 1810. (Sheet 70 in David and Charles reproduction series). The quarry site has been enlarged x 5. Note the hachures on the left indicating the ditch and triangles on the right denoting the bank.

Thus the Great Chalk Wood lime quarry would have been uneconomic by the time the river Thames was opened to barges by 1785 and bringing slaked lime from the Kent chalk quarries to Reading. If at the end of commercial life, the bottom of the ditch was exposed chalk, it could have taken 50 to 75 years of leaf fall for the trees to regenerate. The OS staff in 1810 would have seen a tree-less ditch and bank which no one claimed even in the Enclosure Award survey of 1812.

Conclusion

The most likely dates for the use of the quarry are from 1750, when chalk was in great demand for the agricultural improvements of the time until 1785 when Thames barges could transport lime from Kent to Reading at a lower price than via horse and cart.

Possible Future Work

The following are only tentative suggestions and would need serious consideration before starting work. However a cross section of the trench and spoil heap would be useful to check the proximity of the chalk to the surface; check the volume of the trench and seek to discover the remnants of the railway line. An archaeomagnetic survey might well discover the site of the lime kilns as once heated material discloses itself by different lines of magnetic force.

◆◆◆

Bibliography

Burton, Anthony. The Canal Builders, 1972, David and Charles.

Colvin, H. M. A History Of The Kings Works, vols 1 & 2, 1962, HMSO.

Colvin,H. M. The Building Accounts Of Henry III, HMSO.

Davis, R. H. C. The Ford, The River and The City. Oxoniensia XXXVIII, 1973 pps 258 — 267.

Dewey, J &F. The Book of Wallingford, Barracuda Books, 1977

English Barons, The. The Magna Carta 1215, Westair Reproductions Ltd.

Hassall, T.G. Oxford City Walls, V.C.H. Oxon vol IV 1979 p 310.

Ordnance Survey, Oxfordshire sheet 13, 1 inch to 1mile 1830, David and Charles. Sheet no 70.

Raistrick, Arthur. Industrial Archaeology 1972, Methuen.

Salter,H.E.,Boarstall Cartulary 1251, Oxford Hist. Soc. 1930, page 64.

Thacker, F.S. The Thames Highway, vols I & 2 1920, David & Charles.

Williams, Richard. Lime Kilns and Lime Burning, 1989 Shire Publications.

South Oxfordshire Archaeology Group exists to discover new aspects of archaeology and industrial archaeology and to promote greater awareness of our historical past in South Oxfordshire. We have a monthly meeting in the Free Church Hall, Goring and weekly digging on Sundays at the Roman site at Gatehampton.

If you would like details of how to join SOAG, please telephone the President, Mrs. Cynthia Graham Kerr.

President: Mrs. Cynthia Graham Kerr

The Thatched Cottage

Whitchurch Hill

Oxon, RG8 7NY

01734 842901

Vice Presidents: Dr. Malcolm Airs

Professor Peter Fowler

Professor Stuart Piggott

Printed by Albry Printing Co. Ltd, Wallingford.