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Winford Ochre and Oxide

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Introduction

Before the advent of artificially synthesised pigments, these were extracted from naturally occurring animal, vegetable and mineral sources, particularly the latter. Virtually all areas of England and Wales have seen the exploitation of natural earth colours at some time or other, generally on a small scale[1]

Greater commercial production from the eighteenth century onwards naturally tended to concentrate upon those areas most favoured with raw material and access to markets. Economies of scale in tum gradually concentrated these enterprises into a smaller number of capital intensive companies. These too gradually disappeared once the chemicals industry had become established and firms like ICI were able to manufacture a wider variety of colours both cheaper and more consistent than the natural product.

One area rich in natural earth pigments was Winford, now lying within the boundary of the County of Avon but previously in Somerset. Here occurs the mineral Red Ochre, a clay containing a very high proportion of Ferric oxide (Haematite) - generally 30% to 40%, giving it a deep red hue, but some even up to 70% or 80%[2] with a darker almost purple colour. The lowest percentages gave a bright yellow hue to the clay.

Somerset Redding

In the Winford area the umbrella term 'Redding' is commonly used to describe all shades and qualities of the mineral and its presence has been known for some considerable time. It is possible that the Romans were aware of and used readily accessible deposits, but the earliest recorded evidence is in Pettus's Fodinae Regales (1670). In this work 'Red Oker' is mentioned as being found in Somerset, probably around Winford.[3] A piece of land at Winford known as 'Redding Pitte' formed part of a wedding settlement in 1675[4] and in 1727 the Reverend T. Cox wrote that near Chew Magna:

> *' is dug up a red bolus called by the Country People Redding, which is distributed from there all over England for the Marking of Sheep, and some other uses'.*[5]

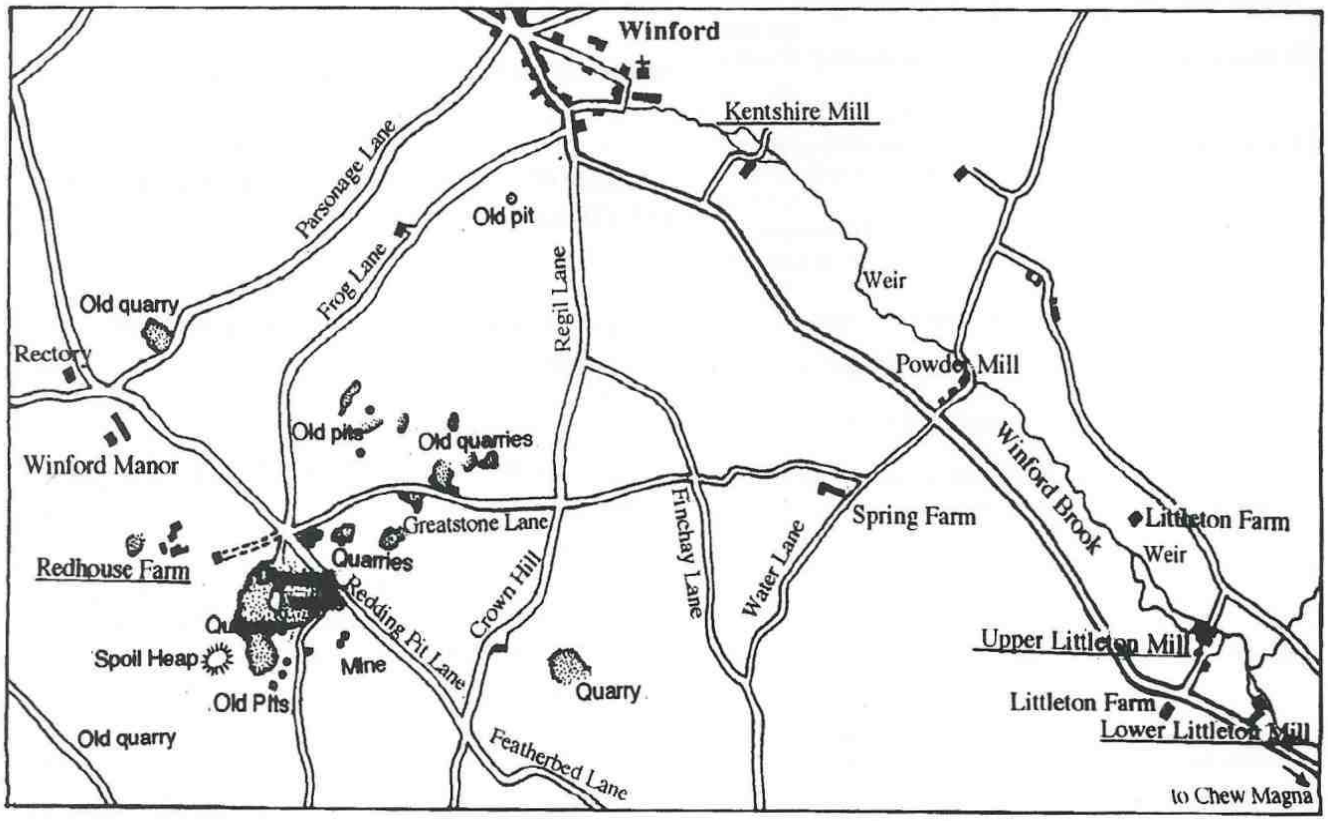
In the will, dated January 1750, of one John Newman who owned the Redhouse property at Winford (then known as Newmans) he bequeathed to his wife:

> *'...full and free liberty, power and authority...to dig and quarry thereon for Red Earth, Cole, Stone or any ore or mineral whatsoever... '.*[6]

Ten years later in January 1760 the Swede Bengt Ferrner, on a tour around the West Country, reported on a visit made to the Redding pits at Winford which, in translation sounds remarkably similar to the report by Rev. Cox:

> *'On the map of Somerset it is indicated that the Red Bolus, which people here call Redding, and is used to mark sheep all over England, is dug up at Chew Magna'.*[7]

Collinson (1791) mentions the occurrence of a *'peculiar kind'* of ochre found on Winford Hill which was *'bright and smoother'* and not soluble in water.[8] Since that time there have been numerous references to the presence of Redding in Winford but no detailed account of the industry.



Winford Quarry and Mill Sites

Industrial Scale Production

Until the 1870s all workings at Winford were on a small scale with a number of enterprises operating in close proximity to one another. These included companies such as the Regil Mining Company, the Fawler Coal and Iron Company (known after 1882 as Bolton & Partners), the Bristol Ochre and Colour Company, and Owen Firmstone & Owen. There were also what amounted to basically one-man operations, some probably only part time. These included, in the 1870s, William Wookey, Michael Hobbs, James Lockhart and Charles Pearce.[9]

Up to 100 miners were reported to be working in this area during the l860s,[10] but it must be remembered that the haematite was by then not only being extracted for pigment but also for iron smelting. Being practically phosphorus free, haematite was in high demand for steel production in cementation furnaces and the early types of Bessemer converter. Ore was sent to the Ashton Vale Iron Work[11] and to the steel works of South Wales. It was because of this use that in 1872 the Winford Red Haematite Iron Ore Company was principally formed. A group of men engaged in the iron trade in the Midlands were behind the venture and they invested heavily in plant and machinery. A horse- drawn tramway was constructed at the Redhouse site, processing plant was installed and around 30 wagons were ordered from the Birmingham Wagon Company.[12]

With a mounting recession in the iron and steel trade by the late 1870s, and cheaper Spanish iron ore imports from 1876, it was soon realised that the future of the local trade lay more in the ochre side of the business. This was confirmed in a report and valuation of the minerals and assets compiled in 1833 by Thomas Morgan, a mining and civil engineer of Bristol for the Winford Iron Ore and Redding Company Ltd,[13] who by then had bought out virtually all local competition. The only other company operating on a relatively large scale in the Bristol region was the Golden Valley Ochre and Oxide Company at Wick

Extraction and Processing

The means of getting and methods of processing minerals have probably changed most during the last 100 years or so. Until the end of the nineteenth century it would seem that redding was obtained either from open, easily accessible workings or from shallow underground mines, possibly after the style of bell pits which were sometimes interconnected. Certainly *'Redding Pines'* were recorded around Winford from the seventeenth century. When opencast working began on a larger scale at Redhouse towards the end of the last century numerous old workings were discovered, some 40-60ft deep.[14]

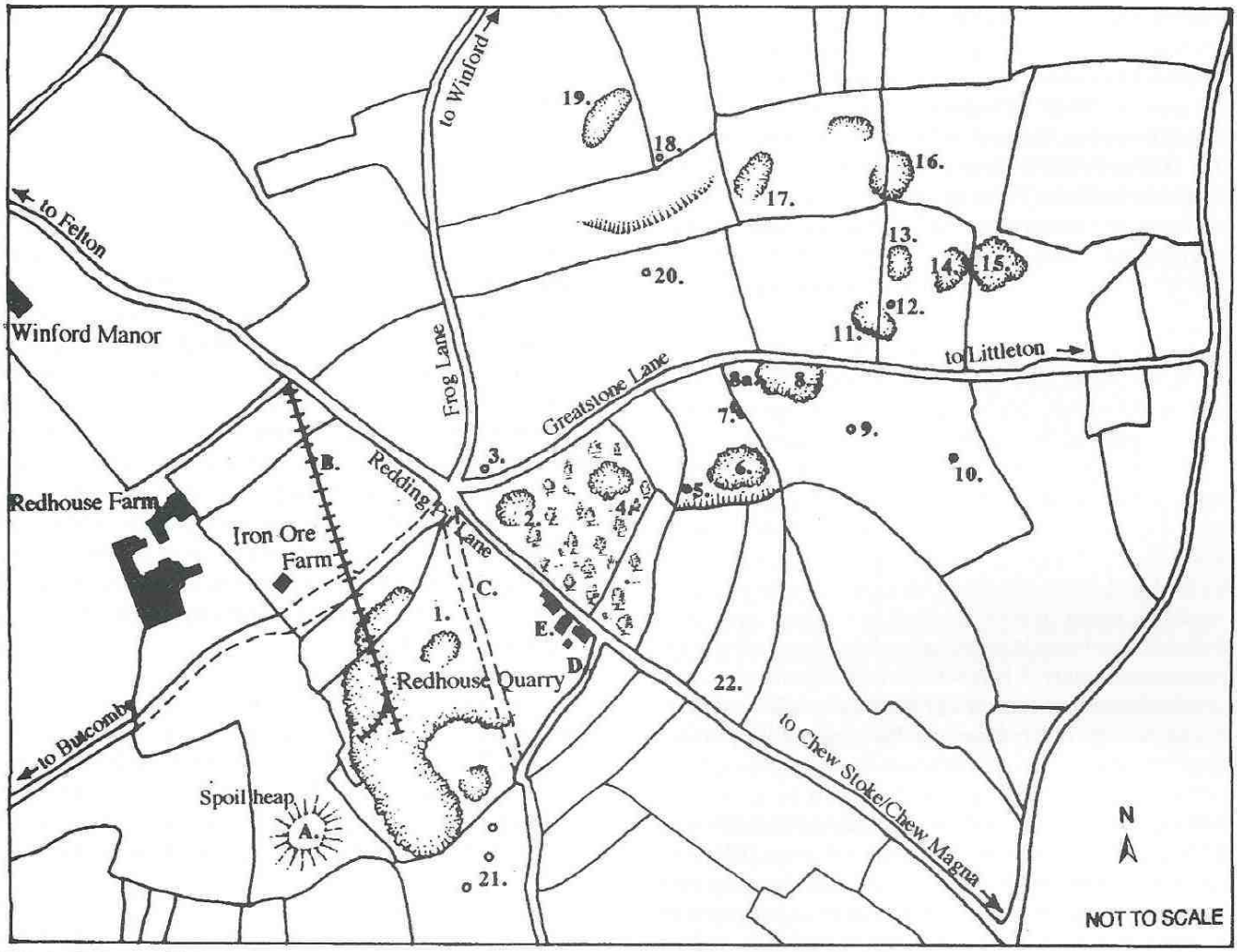
The getting of the mineral, until the advent of mechanisation, was by the use of black-powder, pick, shovel and muscle in all weathers. Holes for gunpowder charges had to be drilled using hand-augers, one man holding the auger and turning it one twist, in between blows by a sledge hammer wielded by another man. Even when underground mining was common practice it would seem that ochre was still brought to the surface by being shovelled from man to man up a series of stepped platforms, the size and extent of workings being such that any form of mechanical winding would have been impractical.[15] However, in 1925 when larger deposits were being got, the Winford Iron Ore and Redding Company purchased a Basnard petrol-driven crane, the first in this country to be so employed.[16]

Until the 1930s, material from the working face of open cuttings had to be shovelled into wheelbarrows. Often these had then to be wheeled along an inclined barrow track which varied in rise of anything up to 30ft, dependent on the depth of excavation. The track was one or two planks in width and was laid across staging. These runs could be as long as 40yd. For the men on this *'hollow run'* as it was called, a great deal of effort was required. Even empty, barrows were heavy, as pneumatic tyres did not replace iron wheels until 1933. There was always the danger of slipping off the unfenced barrow run and the added hazard of the planks springing up and down as the men walked along them.[17] It was not until after the second world war that mechanisation took over completely with the advent of excavators, mechanical shovels, dumper trucks and compressed-air tools.

Before grinding equipment was installed at Redhouse it is possible that at least some of the crude ochre was taken to Kentshire Mill (ST 5452 6488) further up the Winford Brook from Upper Littleton Mill. According to the Winford Tithe Apportionment of 1839 this had been a colour mill but was not working at that time. By 1887 it was described as a ruined mill[18].

The mineral arrived at Winford, having previously been broken into pieces roughly 4-6in dia, to be processed first of all by edgerunners which crushed the material further. This material was crushed wet under the edge runners to keep down dust. This equipment consisted of pairs of granite stones with cast-iron tyres, placed vertically to revolve in a rounded, shallow, cast-iron pan, all set inside a brick-built tank about 5ft in height and 8ft square. The grindstones varied in diameter from about 48-63in with a width of 16in, each one weighing from 2 to 3 tons. Each pair of stones was turned at about 10 rpm, supported by a 4in steel axle connected to a post from a socket at the base of the pan. The post was turned from above by a pinion and crown wheel powered from the main shafting.

After grinding into slurry the material was passed through a series of tanks or settling pits (about 11 in total at Upper Littleton Mill) which, by a process known as levigation, separated it out into different particle sizes. The residue from the tanks was pumped out, using chain pumps, on to the floor of a drying kiln, of which there were five at the Upper Littleton Mill. The kilns were about 90ft long by 15-20ft wide and, to dry the mineral, hot air was passed under the tiled floor. Although as much water as possible had been removed prior to the mineral being taken to the kiln, a layer of water did accumulate on the surface as the sediment initially settled and had to be drawn off. Once dried, usually after two or three days, the compacted powdered mineral was crushed and packed into barrels or sacks to await despatch.[19]



Winford Quarry Sites

General view of part of Redhouse Quarry

Quarry Sites

The area that has seen most, if not all, ochre working at Winford lies approximately one mile SSW of the village (see map p2). It can be readily divided into two sections - those lying to the south west and north east of Redding Pit Lane.

To the south west, covering some 12½ acres, the Redhouse Quarry Area is now disused and covered in a variety of vegetation, the colour of which contrasts sharply with the reddish soil, and, in wet weather, the bright orange-red puddles that abound. The whole area has seen man-made disturbance on a massive scale and this is plain to see in the now rugged terrain.

l. Until the early 1870s, when the Winford Red Haematite Iron Ore Company bought the Redhouse Estate, most of the workings were shallow underground pits with some small open quarries. The Company extended underground, sinking new shafts some of which penetrated abandoned old workings. A building to house an office, workshop and storeroom was completed, but its site is unknown.[20] By the winter of 1873 the shafts leading into the old workings were abandoned to concentrate on the more lucrative new workings then being opened up. To expedite the transport of ore, a 400yd tramway was constructed during the winter of 1873/4. It was horse-hauled, the wagons running on 16 lb/yd rails.[21] The tramway ran approximately NNW from the main Redhouse Quarry site to a point where the lane from Redhouse Farm joins Redding Pit Lane (ST 5333 6408). Up to 1878 all the output from this site was taken to Bristol for processing or for sale in its crude state[22]. Basic processing equipment was then installed at the quarry which by 1882 included stamps, grinding, levigating and drying plant. Power was by steam as there was no running water at the quarry.[23] The Winford Levigating and Grinding Mills, as they were then called, produced mainly red ochre for paint until the mid-1880s. There is no physical evidence left of this mill. As the workings extended, mainly by opencast, it was found necessary to re-route the road to Regilbury. This was done by moving the junction with Redding Pit Lane some 200yd to the south east, the Winford Iron Ore and Redding Company bearing the expense.[24]

The tramway was also extended and improved as operations were increased, but by the early 1920s steam traction engines were being used for transport, soon to be followed by motor lorries. Visible today, besides the disturbed terrain, is the large overgrown spoil heap which used to support a powder house and a vertical steam winding engine with boiler.[25] Various corrugated iron structures remain, mostly from the immediately post-war period of operations.[26]

To the north east of Redhouse Quany, on the other side of Redding Pit Lane and straddling Greatstone Lane is the second area. This is about 100 acres in area and has seen extensive working.

2. At the junction of the two lanes (ST 5348 6396) is the only working quarry extracting ochre in this country. It formerly belonged to the Winford Iron Ore and Redding Company but in 1981 they sold all their quarry land to a Midlands colour company. The mineral is still worked occasionally and it has been mooted that they may extend their operations.

3. The wooded area to the south and east of this small quarry is known as Dawbarns, after a former owner. There has obviously been a lot of activity here, as evidenced by the much-disturbed land surface.

4-22. Fanning out from Dawbarns in a NNE direction are the sites of numerous workings of varying sizes, although none are anywhere near as large as the Redhouse quarry. Some of the workings were underground, some surface. Around 20 have been so far identified, with visible remains ranging from the obvious to virtually nothing (see following location map and list of details). All are overgrown, sometimes only identifiable by shallow circular depressions or changes in vegetation - again usually roughly circular in shape. Further investigation of this area will continue.

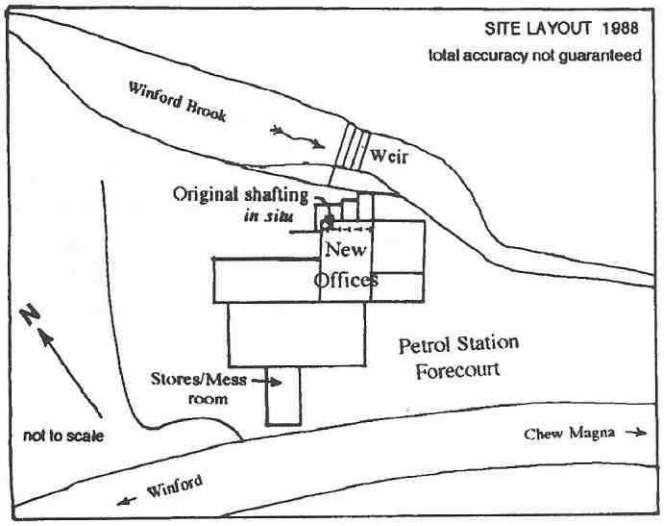
Mill Sites

Although grinding and processing were installed at Redhouse Quarry it was felt by the Winford Iron Ore and Redding Company that they needed a larger processing capacity in order to expand. Accordingly in 1878 they purchased the nearby Lower Littleton Mill, then a grist mill dating from 1823, on a site (ST 558 636) that had previously been used for a fulling mill and, between 1769 and 1823, for a gunpowder mill.[27] Situated on the Winford Brook, a main tributary of the River Chew over a mile to the east of the quarry, it was purchased for the sole purpose of wet-grinding and refining yellow ochre. Considerable quantities of this mineral were exploited by the company, especially in the early days, but they had the problem of having to keep scarce plant idle which could not be used also for processing reds without introducing loss of colour consistency. The waterwheel, presumably undershot,[29] was eventually replaced by a water-turbine and later a steam engine. Although this site has undergone considerable changes - it is now a garage and filling station with some industrial units - it is still possible to identify some of the original buildings: that standing closest to the road was used as a store for bagged redding, sacks often being piled 13 or 14 high. This was also used as a mess room for the men. The restored building to the rear, now containing offices, retains some of the original shafting but the engine house was pulled down some years ago. Most of the millpond has been filled in.

Although the processing of bought-in raw materials such as talcum powder and penicillin were undertaken here in the early 1960s virtually all Winford ochre processing had ceased by the late 1950s.

Standing upstream is Upper Littleton Mill (ST 556 637), bought by the Winford Iron Ore and Redding Company in 1881. It would appear that this mill is basically an eighteenth-

century structure and, before being convened to the production of ground and refined colours and paints, had been a leather mill, a fulling mill and ,between 1853 and 1875 , a snuff mill owned by W.D. & H.O. Wills.[29] The original intention had been to process yellow ochre by dry-grinding and levigation but by the mid 1880s, when it seems processing ceased at Redhouse, reds and purples were taken on as well. Like the Lower Littleton Mill, the waterwheel, producing about 10 hp[30] was replaced by a water turbine at unknown date and then by a steam engine, possibly a Robey. In 1922 a Marshall engine, *Margaret*, was installed and ran until the 1960s.



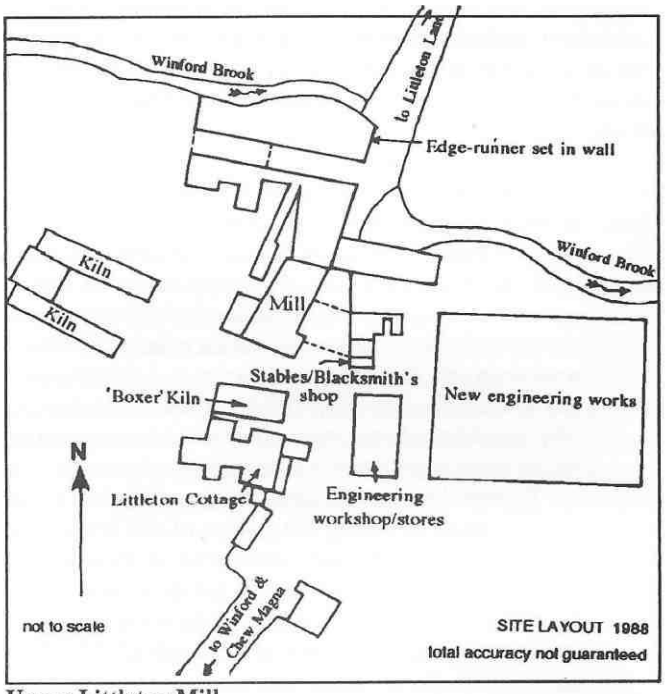
Lower Littleton Mill

Today this site is a complex of industrial units with a few added structures. The main building, with walls of random rubble like all older buildings on the site, forms the central focus. Although this now has a single pitch roof the original double pitch is still *in situ* beneath it. The most southerly part of the structure, for most of its time colour mills, has been used as a blacksmiths' shop for the repair, maintenance and manufacture of plant and machinery. The other parts were used in processing colours. This included machinery consisting of leather beaters on a wheel to beat redding through a frame of 'silk'. The resulting finer material was then passed into edgerunners for wet-grinding and then into the vats.

Three of the drying kilns remain. Two of these lie to the west of the mill building - one has been converted for use as a warehouse, retaining most of the original structure - but the other has lost much of its roof and is stacked with bits of industrial machinery. Part of the tiled drying floor, however, remains fairly intact. The third kiln, known as the 'Boxer Kiln', is situated just to the south of the mill building. It has also been renovated and is now used as a workshop and office.

To the east of the Boxer Kiln lies a corrugated iron structure reminiscent of an aircraft hangar. The ground floor was used as an engineering workshop housing lathes, whilst the upper floor was used to store and cut the brown paper used in lining barrels for dispatch of processed ochre overseas.[31] Further to the east a new structure now stands on the site of what was a large spoil heap which contained much red sand that was considered unusable until the advent of modem processes.

Littleton Cottage stands on the southern edge of the site. Most other structures were erected between 1880 and the first world war, with numerous modifications since then. All the watercourses, apart from the main channel of the Winford Brook, have been filled in, but not built over. As something of a tribute to the past, an edgerunner stone has been set into a building at the northern end of the site, close by the now overgrown track leading to Littleton Lane.



Upper Littleton Mill

Edgerunner stone Upper Littleton Mill

Conclusion

The natural earth colour industry of Winford, once the life-blood of the area, is now a thing of the past. Nature has taken her course at the quarry sites and the mills have been put to more modern uses. This is fortunate as some remnants will survive for the foreseeable future. Much still needs to be done in the accurate recording of what does remain.

The important part played by the natural earth industry in this country, especially from the mid-nineteenth century until the 1920s, has gone largely unrecorded. Other extractive industries such as coal, lead, slate, tin and copper have stolen much of the limelight. This article in an attempt to redress that imbalance.

Acknowledgement

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15. This and other miscellaneous information on the methods of extraction and processing was supplied in a series of taped interviews and conversations during 1987-8 with George Pickford, aged 89, who worked as an engineman for the Winford Iron Ore and Redding Company for a total of 52 years.
16. Minute Book of the Winford Iron Ore and Redding Company, Minute nos 2292 (30 May 1924), 2295 (18 August 1924), 2303 (19 August1924)
17. George Pickford
    This is shown on a tracing of the Kentshire Property taken from a Conveyance dated 7 July 1887. It was bought at this time by F.C. Perry, Chairman of the Winford Red Haematite Iron Ore Company and subsequently of the Winford Iron Ore & Redding Company. On his death in 1900 the Company purchased the property.
19. Information supplied by Peter and Geoffrey Taylor of Winford Red Ltd, George Pickford and Spence, A.J. 'Watennills of the Chew Valley‘, unpublished thesis (1983)
20. Minute Book of the Winford Red Haematite Iron Ore Company. October-December 1872
21. Ibid. Minute nos 162 (5 December 1873) and 180 (25 February 1874)
22. Janet Newman of Ridgehill recalls her father saying that when he was a boy of 13 (late 1880s) he used to accompany the horses and carts of redding to a warehouse close by what is now the Bristol Exhibition Centre.
23. ‘Valuation of Freehold Properties’, note 14
24. No date has been established for the moving of the road
25. George Pickford and an Insurance Schedule 1935/6
26. Insurance Schedule, 1955. There were other buildings dotted around Redhouse Quarry and Dawbarns, mainly store sheds and huts to shelter the quarrymen. The location of them is unknown and there are certainly no visible remains.
27. Winford Iron Ore & Redding Company, Deeds and Leases
28. There is no documentary or pictorial evidence to support this but the stepped weir would suggest this was the case.
29. Winford Iron Ore & Redding Company, Deeds and Leases
30. ‘Report and Valuation‘, note 13
31. George Pickford and records of the Winford Iron Ore & Redding Company

Upper Littleton Mill
showing mill (centre), Boxer Kiln (centre left) and engineering workshop (right)

Upper Littleton Mill
Drying kiln