

## Fullers Earth from Midford

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References to fullers earth, particularly relating 'to the history of the West Country's woollen industry, are comparatively common but never seem to be accompanied by any satisfactory explanation as to what this substance is nor where it comes from. This apparent lack of readily available information, together with the imminent disappearance of some substantial remains of a fullers earth works near Midford, prompted further investigations into this little-known industry.

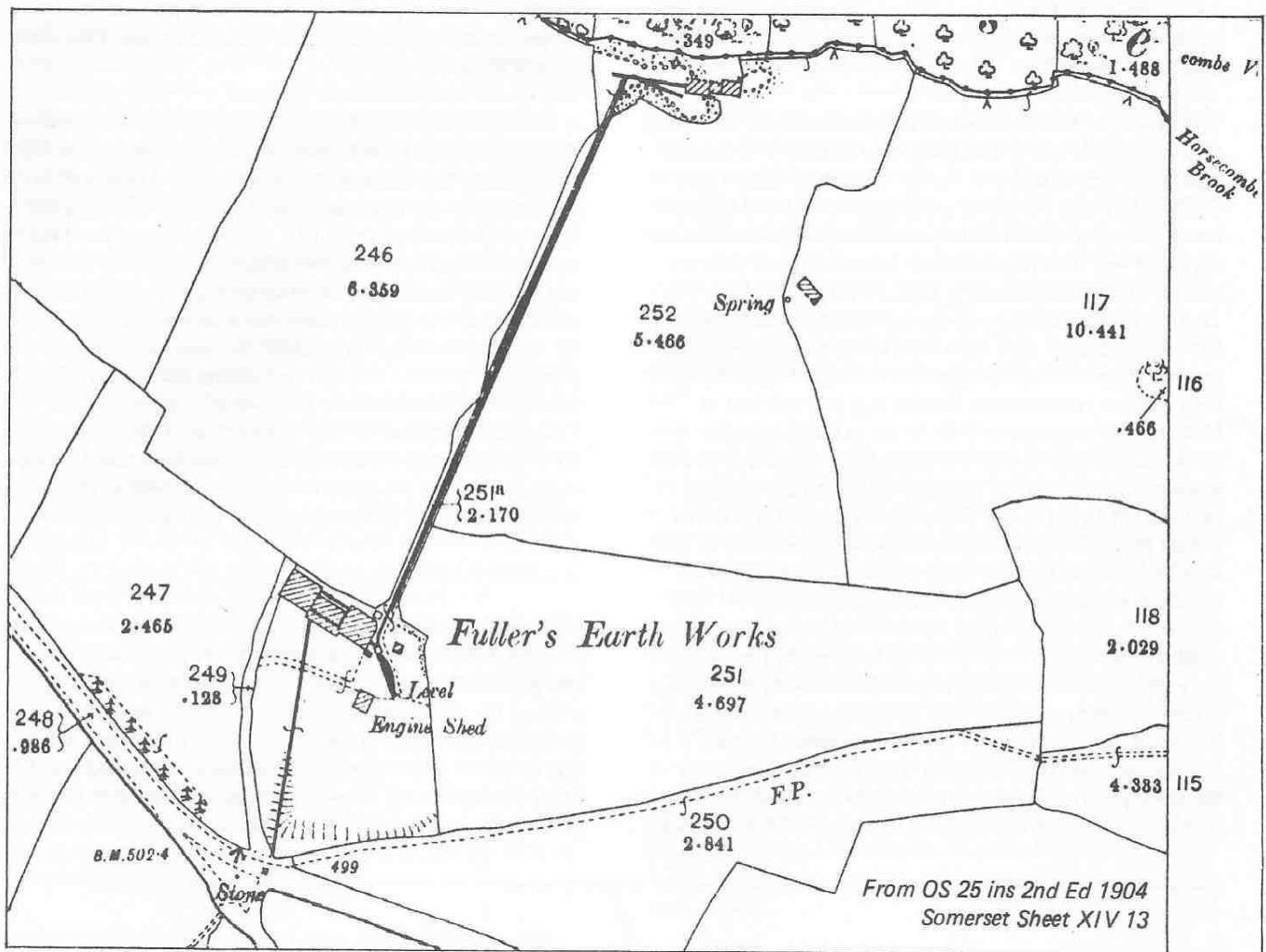
Fullers earth is a term which has acquired two quite separate meanings. On the one hand it is the name given to a soft clay which has the ability to absorb oil, grease and colouring matter - which for example, can be used for cleansing or 'fulling' woollen cloth. In past centuries, many clays having such a property were known indiscriminately as 'fullers earth', but in more recent times it has been recognised that clay richest in the mineral montmorillonite is the most effective. Current uses for the clay, exploiting not only this but also other useful properties that it has, extend far beyond the woollen industry to embrace such things as the bonding of foundry sands and various applications in the oil-refining and cosmetics industries<sup>1</sup>, and it is known as 'commercial fullers earth'. Secondly, Fullers Earth is the name of a particular stratigraphical division of the rocks of the Middle Jurassic System. Confusion creeps in because only a certain part of this division of rocks and then only in certain areas contains enough montmorillonite to make the extraction of commercial fullers earth a worthwhile proposition, whilst fullers earth can also be found in rocks of the Cretaceous System, mainly in the Greensand Formations.<sup>2</sup>

Commercial fullers earth has been obtained from a large number of different locations as far apart as Cornwall and Scotland - sometimes intentionally, and sometimes, as at the Golden Valley Ochre Works at Wick, Bristol,<sup>3</sup> when other things were being sought. Eventually, however, activity became centred on three major deposits; two cretaceous, these being at Redhill in Surrey and at Woburn in Bedfordshire, and one jurassic at Bath, formerly in Somerset and now in the County of Avon. Other 'reserve' deposits are known to exist in such places as Kent and Oxfordshire, but have not yet been fully exploited. In Surrey and Bedfordshire the fullers earth is extracted by opencast mining using draglines and scrapers, whilst Bath is unique in extracting it by deep mining methods.<sup>4</sup> Here the exploited bed is in the Upper Fullers Earth Clay, which lies above beds of Fullers Earth Rock and Lower Fullers Earth Clay;<sup>5</sup> it averages some 6 ft in thickness and contains both known colours, namely blue fullers earth clay and yellow fullers earth clay. Being soft, the clay is easy to extract. Formerly done with pick and shovel, it is now cut with compressed air picks and taken from the adits by means of a narrow-gauge railway.<sup>6</sup>

Unlike the Woburn deposits, which were described in some

detail as long ago as the early eighteenth century,<sup>7</sup> little appears to have been written about the extent and methods of early fuller's earth workings in the Bath area. It seems logical to assume that the material was extracted on a small scale and used purely locally in the woollen industry, but this is only supposition, and this early period really deserves a separate detailed study. When the Somerset Coal Canal was built several tramroads were constructed to convey fullers earth to the canal for shipment. One terminated between locks 10 and 11 of the Combe Hay flight,<sup>8</sup> and others existed slightly to the east of this and also on the Radstock branch.<sup>9</sup> Rees makes one brief reference to Bath in the 'Fullers Earth' article in his *Cyclopaedia* (1819), but the industry apparently declined as the nineteenth century progressed, for different editions of Ure's Dictionary<sup>10</sup> published in the 1840s and 1850s make no mention of the Somerset deposits and imply that Wiltshire cloth manufacturers received supplies from Surrey. In 1876<sup>11</sup> it was stated that 'shafts were formerly sunk in the Fullers Earth south of Bath to a depth of 20 or 30 feet, with levels. It was then much used in fulling at the Cloth Mills at Frome and in Gloucestershire. It is however rarely if ever worked now in the district'. The same source mentions Duncorn Hill, Dunkerton, Englishcombe and Combe Hay as places where fullers earth had been worked and refers also to a shaft near South Stoke and a pit at Odd Down where it had occurred, though these may have been excavated for some other purpose. In the 1880s there was a sudden revival of interest in the deposits in the Bath area. It is conceivable that this was brought about by the construction of the Bath extension of the Somerset and Dorset Joint Railway (completed 1874), since fullers earth was 'well exposed in cuttings of the new railway',<sup>12</sup> but a more likely explanation is that put forward in 1894 - 'the improvement is due, in no small degree, to the successful application of fullers earth to the oil-refining business in America, where there is now an almost phenomenal demand for it'.<sup>13</sup> Midford Works dates from this period of revival, having been opened sometime in 1886,<sup>14</sup> though its independent existence was to be short-lived. In 1890, it was together with Combe Hay Works, a works at South Stoke - the location of which is not known - and two of the Redhill concerns, incorporated into the Fullers Earth Union Ltd: in the 1950s this organisation in turn became part of Laporte Industries who still carry on operations at Combe Hay and Redhill.

Fullers earth destined for Midford Works was excavated north north-east of the point where the Midford Road (B3110) diverges from the Old Midford Road which went past Pack Horse Farm, the adits being just below the road on the slopes of Horsecombe Vale (ST 753 616). It is possible that this area was once treated as something separate from Midford, and may have been the 'South Stoke Works' referred to above. Once brought to the surface, the fullers earth was latterly sent some 400 ft down one long self-acting incline (loaded wagons descending, empty ones



ascending) which extended from the side of the road right down to the Horcombe Brook. In early days operations must have been different, however, since the 1904 25" OS map shows the main incline starting some distance down the slope, and a separate one on a different alignment extending up to the road: exactly how the system worked then, and what was in the 'engine shed' marked on the same map remains something of a mystery. Down in the bottom of the valley, the fullers earth was mixed with water drawn from the brook, and then crushed in a mortar-mill to form a slurry: this slurry was then fed into an earthenware pipe sunk into the ground on the south bank of the brook, and thence flowed down to the works proper.<sup>15</sup>

These were situated some distance down the Horsecombe Brook at a place between Midford and Monkton Combe known as Tucking Mill, which is just upstream of the brook's junction with the larger Midford Brook and where the valley is spanned by the Tucking Mill Viaduct of the former Somerset and Dorset Joint Railway. The site is of considerable interest in itself, due to its connections with William Smith, the 'Father of English Geology'. As described by Cox,<sup>16</sup> Smith was dismissed by the Somersetshire Coal Canal Company. Later on, he set up in business with his brother from Oxfordshire quarrying Bath stone and sawing it to size in a water-mill on this site. Documents in the possession of Laportes prove that it was this brother who lived in what is now known as 'William Smith's Cottage', whilst Smith himself lived in a three-storey cottage just east

of this, near the drawbridge over the canal. What happened to the mill after it passed out of the hands of the Smiths in 1819, and before Midford Fullers Earth Works was built in 1886 is not known: the latter was built behind the mill on the site of the former millpond, and the mill was demolished in 1931.

Having arrived at the works, the slurry was diverted from the earthenware pipe into one of a number of open-air catch pits, where it remained for several weeks to allow the fullers earth to settle and the water to be drawn off gradually. This left fullers earth sludge which was removed to covered sheds and spread on the drying floors. These consisted of metal plates raised off ground level on piers about a foot high and eighteen inches apart made of bricks or wooden sleepers. Hot air would pass through the spaces beneath the floors, the source of heat being a substantial Cornish boiler housed in a boilerhouse alongside the main building. Waste gasses passed out through a square stack about 80 ft. high which was demolished by Dawsons the steeplejacks of Clutton in February 1968 as it had become unsafe. When dry, the fullers earth was loaded into sacks and taken away by road, generally to the Great Western Railway's goods yard at Bath: there is no evidence that it was ever sent by means of the canal or Midford Station. The buildings at Midford were comparatively crude, the walls being made of corrugated asbestos or thin slabs of Bath stone on a low brick base, and the roof also corrugated asbestos on a timber framework. It is possible that these materials replaced an

## BIAS JOURNAL No 11 1978

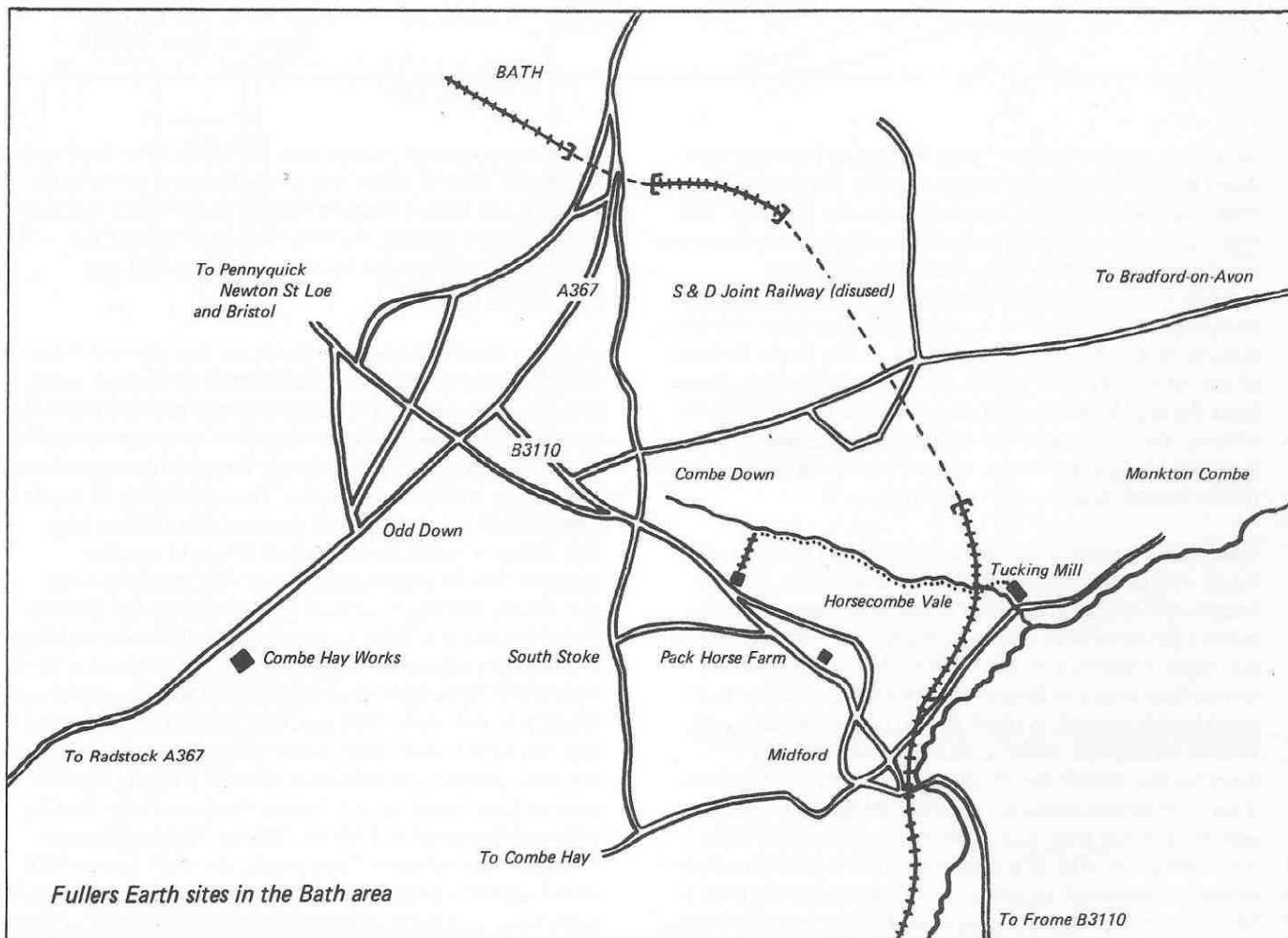
earlier wooden structure on the same brick base. Many of the bricks used were made locally at Shortwood Brickworks (see *BIAS Journal 8*).

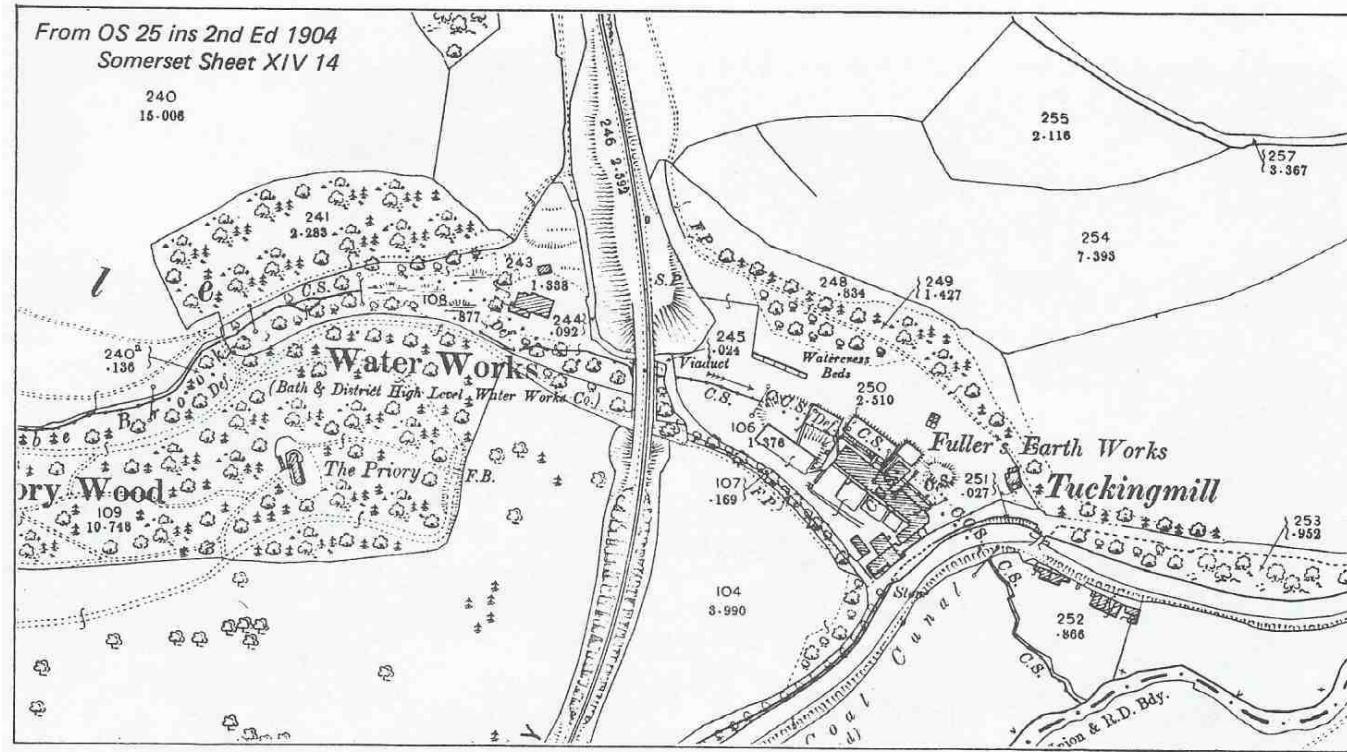
The demise of the works is not well documented. They were certainly still in use in 1930, as a contemporary newspaper report informs us that one Arthur Gerrish, a night stoker at Tucking Mill was flung into a 6ft deep culvert and buried beneath several tons of fullers earth when the metal plate on which he was standing collapsed. He was dug out alive by his workmates and rushed to Bath Royal United Hospital. Laporte's records show that the works closed 'soon after the war' and were used for a time as a warehouse, but this too was discontinued sometime in the early 1960s. None of their current employees at Combe Hay ever worked at Midford nor remembers them in use as anything other than storage buildings. No photographs of the works during their working years have been discovered. By 1978 there was nothing left to see at the 'South Stoke' part of the works except for some subsidence and the overgrown line of the long incline with the odd piece of rusty rail and rope, all buildings and adits having long since disappeared. At the bottom of the valley there was a ruined building and one or two metal cogs from the mortar-mill, whilst the earthenware pipe survived virtually intact. The Tucking Mill drying sheds remained, complete with boiler house and Cornish boiler, though the roof had collapsed in several places. Metal plates had been removed from the floors to reveal the brick piers underneath, and outside the catch pits were overgrown but still identifiable. The whole of this area was

due to be developed during the course of the year to accommodate a water storage and treatment plant for the Wessex Water Authority.

A curious footnote to the story of Midford Fullers Earth Works concerns a patent taken out in 1883 (Patent No 2582) entitled *Improvements in the method of and machinery or appliances for the preparation and refining of fullers earth*. The patent describes, complete with drawings, the methods used at Midford in almost every detail - from the slurring and grinding to the settling in catch pits and drying on metal plates, and the applicant was a Charles Richard Dames 'of the City and County of Bath'. No link has yet been established between this gentleman and Midford Works, indeed he is known to have been working for the 'rival' Fullers Earth Mining Co some years later.<sup>17</sup> Nevertheless, there is more than a suspicion that it was his ideas that were being tried out at Midford, where they survived in their original form until the closure of the works.

It should be stressed that the remains of the works described in this article are not only on private property, but are also potentially very hazardous, and cannot be visited without the permission of Laporte's. The author would like to express his thanks to Laporte's and to the Wessex Water Authority for their co-operation and assistance, and also to BIAS Members Hugh Torrens and Owen Ward for responding to his Bulletin appeal for information.





## REFERENCES

- 1 A good, concise account of current exploitation and uses appears in Blunden, John. *The Mineral Resources of Britain: a Study in Exploitation and Planning*. Hutchinson. 1975 pp 213-218.
- 2 For detailed definition and other information on occurrence, properties, chemistry, production figures, etc see Mineral Resources Consultative Committee *Fullers Earth (Mineral Dossier No 3)* HMSO 1972.
- 3 Mentioned in Mines Department. *List of Mines in Great Britain and the Isle of Man*. HMSO 1929.
- 4 One small opencast working in the Bath deposits is referred to in Institute of Geological Sciences British *Regional Geology Bristol and Gloucester District* 2nd ed HMSO 1948.
- 5 Full details of the geology of the Bath area can be found in 4.
- 6 Some details of railways present and past in Industrial Railway Society *Industrial Locomotives of South Western England* 1977 reviewed in *BIAS Journal 10*.
- 7 Royal Society *Philosophical Transactions* Vol XXXII 1723 pp 674-5.
- 8 Mentioned in Clew, Kenneth R. *The Somersetshire Coal Canal and Railways*. David & Charles. 1970. Unfortunately, the person who supplied the original information to Ken Clew is no longer alive: there were no obvious remains of this tramroad to be seen in 1978.
- 9 Shown on a map in an article on William Smith by Fuller, John G C M in the *Bulletin of the American Assn. of Petroleum Geologists* Vol 53 No 11 Nov 1969 one of these tramroads survives almost complete as a footpath. The author is grateful to Hugh Torrens for drawing his attention to this article.
- 10 Ure, Andrew *A Dictionary of Arts, Manufactures and Mines*. . . 2nd and 4th eds. Longman. 1840 and 1853.
- 11 Memoirs of the Geological Survey England and Wales *Geology of East Somerset and the Bristol Coal-Fields* Longmans 1876.
- 12 Ibid.
- 13 Article by Cameron, A C G in *Transactions Fed Institution Min Engineers* Vol 6 1894 pp 204-209.
- 14 A footnote to 13 mentions a paper read to the Bath Society on 'Bath (Midford) Refining Works' on March 16th, 1887, and this would probably give the exact date plus other valuable contemporary information. However, a search of local and national libraries has failed to produce this paper.
- 15 Most of the details concerning Midford Works were supplied by Mr Beech, Works Manager, and Mr Anthony, Deputy Works Manager, Laporte Industries Ltd, Combe Hay Works, to whom the author would like to record his thanks.
- 16 Cox, L R article in *Yorkshire Geol Soc Proc* v.25 1942 on William Smith. The author thanks Hugh Torrens for this also.
- 17 Mentioned in article by Cameron (13).

*Yorkshire Steam Wagon of the Fuller Earth Union Ltd at Bath GWR goods yard*

