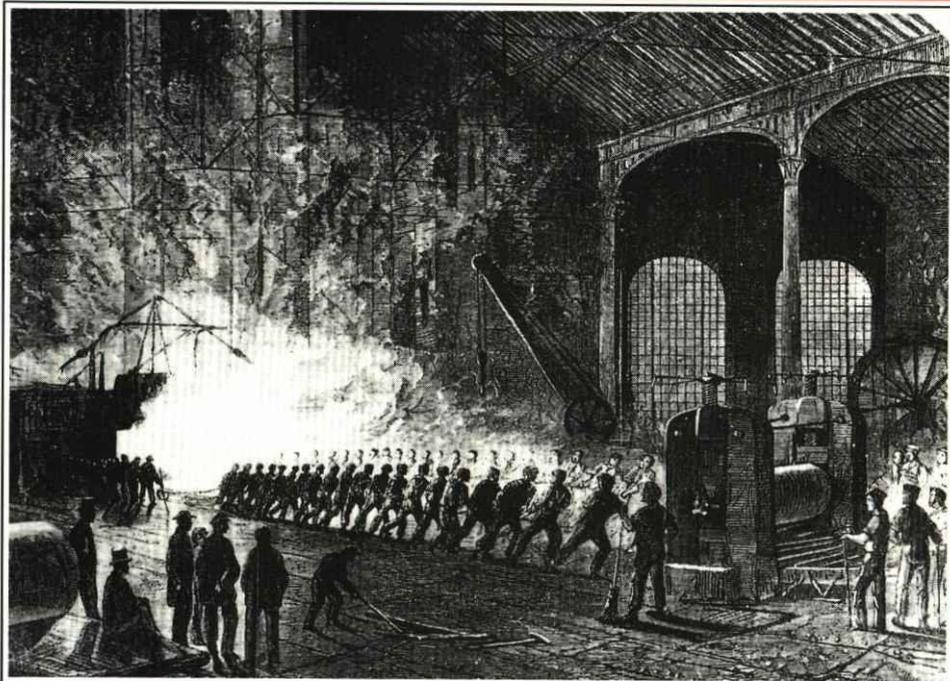


**A Guide
to the**

INDUSTRIAL HISTORY of SOUTH YORKSHIRE



Editor

DEREK BAYLISS

Association for Industrial Archaeology

CONTENTS

1 INTRODUCTION	1	6 STEEL	26	10 TEXTILE	
2 FARMING, FOOD AND DRINK, WOODLANDS		The cementation process	26	Wool	53
Land drainage	4	Crucible steel	27	Cotton	54
Farm Engine houses	4	Wire	29	Linen weaving	54
Corn milling	5	The 19thC steel revolution	31	Artificial fibres	55
Water Corn Mills	5	Alloy steels	32	Clothing	55
Windmills	6	Forging and rolling	33	11 OTHER MANUFACTURING INDUSTRIES	
Steam corn mills	6	Magnets	34	Chemicals	56
Other foods	6	<i>Don Valley & Sheffield maps</i>	35	Upholstery	57
Maltings	6	<i>South Yorkshire map</i>	36-7	Tanning	57
Breweries	7	7 ENGINEERING AND VEHICLES	38	Paper	57
Snuff	7	Engineering	38	Printing	58
Woodlands and timber	8	Ships and boats	40	12 GAS, ELECTRICITY, SEWERAGE	
3 COAL	9	Railway vehicles	40	Gas	59
Coal settlements	14	Road vehicles	41	Electricity	59
4 OTHER MINERALS AND MINERAL PRODUCTS		8 CUTLERY AND SILVERWARE	42	Water	60
Lime	15	Cutlery	42	Sewerage	61
Ruddle	16	Hand forges	42	13 TRANSPORT	
Bricks	16	Water power	43	Roads	62
Fireclay	16	Workshops	44	Canals	64
Pottery	17	Silverware	45	Tramroads	65
Glass	17	Other products	48	Railways	66
5 IRON	19	Handles and scales	48	Town Trams	68
Iron mining	19	9 EDGE TOOLS	49	Other road transport	68
Foundries	22	Agricultural tools	49	14 MUSEUMS	69
Wrought iron and water power	23	Other Edge Tools and Files	50	Index	70
				Further reading	71

USING THIS BOOK

South Yorkshire has a long history of industry including water power, iron, steel, engineering, coal, textiles, and glass. Sheffield is famous for cutlery, silverware and edge tools, while each of the other towns has its own specialities. Many buildings and other relics remind us about this history. They include sites of world importance, such as the only Newcomen atmospheric engine still in its original engine house, at Elsecar, which celebrates its 200th birthday in 1995, the water-powered heavy iron forge at Wortley Top Forge, and the integrated crucible steel shop and water-powered scythe works at Abbeydale.

This book gives notes on historic industrial buildings, equipment and sites where there is still something to see, as an introduction to the industrial history of the area. It is not comprehensive, but aims to cover the most important sites, and some other representative ones. Nor does it tell the whole of the story. Many sites have been cleared, and others have been rebuilt over the years and show little of their history.

Each chapter of the book deals with an industry or group of industries. The Contents list above and an index on page 70 shows where you will find each industry, trade or activity.

Each site is indicated by a letter and number. These are used on the maps on pages 35-7 to show where the sites are. In addition the site entries give an address or location, and a grid reference, for each site.

Most sites are private property but can be seen from a road or right of way. A few are on private land and are not visible. Please respect private property.

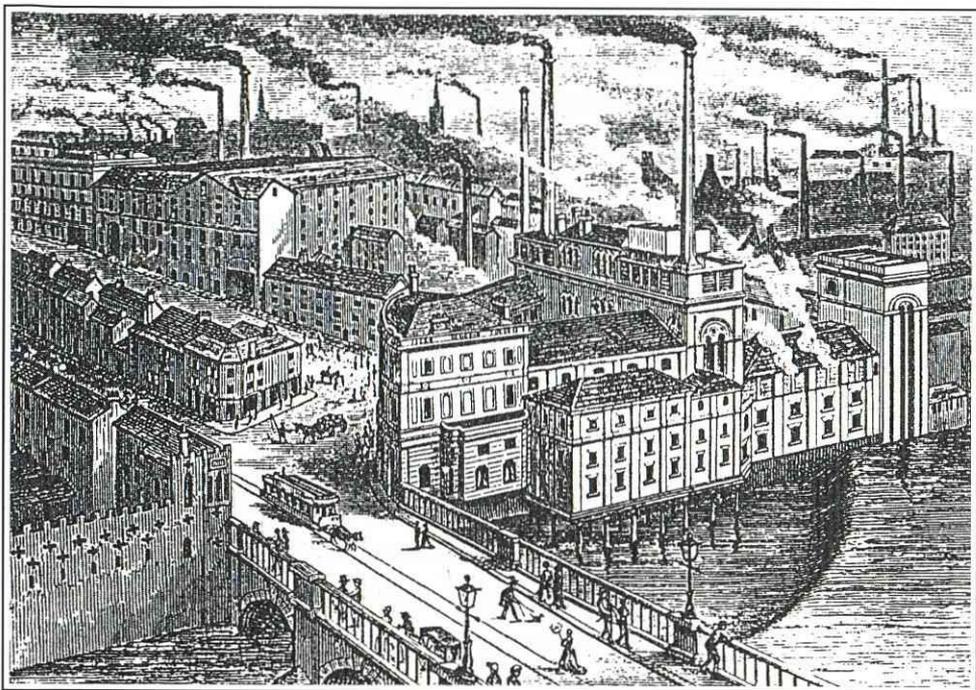
- Sites open to the public
- ❖ Sites that can be seen from a road or other right of way
- Sites that are on private land and are not visible without permission

Many buildings and sites have statutory protection, shown as follows in the gazetteer:

SAM Scheduled Ancient Monument

LSI LSII* LSII Listed buildings in Grades I, II*, and II

INDUSTRIAL ARCHAEOLOGY of SOUTH YORKSHIRE



Industrial Sheffield in the 1870s. Ladys Bridge and Tennants' Exchange Brewery (site A41); steelworks and the future Cathedral behind
Graham Hague collection

INTRODUCING SOUTH YORKSHIRE

The book covers the City of Sheffield and the Metropolitan Boroughs of Barnsley, Doncaster and Rotherham. These formed the Metropolitan County of South Yorkshire between 1974 and 1986. Historically the area was part of the West Riding of Yorkshire (except for parts of south and west Sheffield which were in Derbyshire until the present century). But the term South Yorkshire has been used at least since the early 19th century to describe much the same area as today.

It corresponds fairly closely to the area drained by the River Don and its tributaries. Three of the four main towns are on the Don, Barnsley being the exception. However the headwaters of the Dearne are in West Yorkshire, the upper Rother is in Derbyshire, and the basin of the Went is shared by South, West and North Yorkshire. There are other smaller exceptions.

The main geological features of the area run roughly from north to south. From the west there are successive belts of a coarse sandstone called millstone grit; Coal Measures sandstones and shales with seams of coal, fireclay and iron ore; Magnesian limestone; Bunter sandstones and pebble beds; and clay, silt and peat. The highest ground is on the millstone grit at the western edge, and generally it becomes

COVER ILLUSTRATIONS:

front cover: Rolling wrought iron armour plate at John Brown's Atlas Works, Sheffield, 1863

Sheffield City Libraries

back cover: Newcomen engine house at Rockley (see gazetteer site D8)

Photo: Simon Robinson

lower as you move east, but there are complex ridges and river valleys on the Coal Measures, and a marked west-facing escarpment on the Magnesian limestone north and south of Conisbrough. The rocks dip roughly from west to east, so that coal seams which 'basset' or come to the surface in the Coal Measures continue to the east at increasing depths. Where a seam bassets it can be dug at the surface or at little depth, and the shafts needed to reach it are progressively deeper as you go east. The Coal Measures are known as the 'exposed coalfield', and the area eastward from the Magnesian limestone escarpment as the 'concealed coalfield'.

The area made iron from prehistoric times until 1976, though the local ironstone seams were effectively worked out a century earlier. The woodlands were managed to produce charcoal for the iron industry, and by the 16thC the abundant water power of the rivers and streams was being harnessed to give blast for smelting and to work the iron. As in other areas, nails were one of the main end products. Cutlery was being produced around Sheffield by the 13thC, scythes and sickles in the area to the south-east by the 15thC, and iron wire in the Barnsley area by the 17thC.

Steel appears by the 16thC as a better but more expensive material for cutlery. At first it was imported, and when it was made locally by the cementation and then the crucible methods the raw material was not the unsuitable local iron but imported iron, mainly from Sweden. The crucible method was invented by a Doncaster man, Benjamin Huntsman, who developed it in Attercliffe, Sheffield. For the first time a homogeneous steel could be made by melting. This gave a much better material for most purposes, and it was one of the key inventions of the Industrial Revolution. It established Sheffield as the leading centre for steel and edge tool production.

Coal was being mined in South Yorkshire by the 13thC, and coal and coke became important industrial fuels in the 17thC for glass and malting and in the 18thC for smelting iron and for steam engines. Glassmaking was brought into the area in the 17thC and has remained important since then.

The use of Newcomen's and Watt's pumping engines for drainage made deeper mines possible. Increased production was also helped by John Curr's introduction in Sheffield in the early 18thC of iron rails to improve haulage to the pit bottom and cage guides to help winding coal up the shaft, and by better ventilation, where Benjamin Biram of Elsecar was one of the early 19thC inventors. With improved transport in the 19thC, South Yorkshire became one of the country's leading coalmining areas, and Silkstone and Barnsley, early centres of mining which gave their names to the main seams, became synonymous with quality. The industry has made a deep impression on the social as well as the economic life of the area.

Ironmaking and cutlery grinding were also early users of the steam engine, but the crucible steel and cutlery trades remained relatively small-scale and craft-based until the mid-19thC. This was also true of the silver, Old Sheffield Plate and Britannia metal trade, which made high value products and played a part in capital formation. Banks developed in the 18thC and helped to finance the larger industrial undertakings. The fastest growing steel firms in the early 19thC made files and edge tools for industry, and springs and other parts for the railways. By the mid-19thC heavy guns and (iron) armour plate were added. The first large engineering firms in the area were now developing.

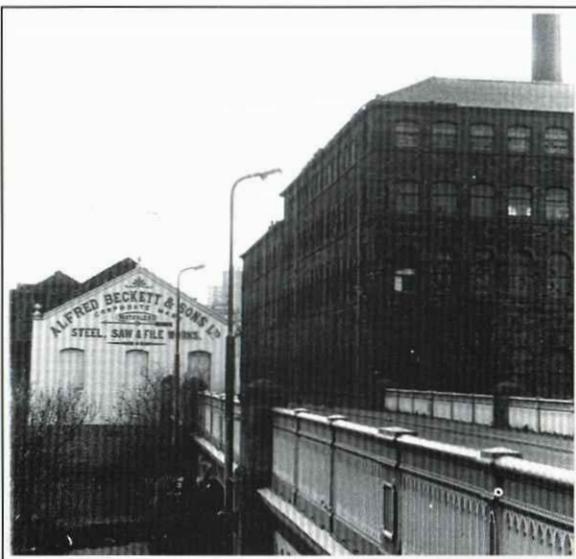
South Yorkshire's industrial development was limited at first by problems of transport to markets outside the local area. It is not on the coast and there is no access, even today, for any but the smallest seagoing ships; sea cargoes have to go to Goole or Hull, or even further afield. River ports developed at the head of navigation at Bawtry on the Idle and Doncaster on the Don. These were also the lowest reliable crossing points and the main north-south route, the Great North Road, ran through them. Rotherham was not readily accessible by water until the Don Navigation was extended there by 1740. Barnsley had to wait for canal links until 1799 and Sheffield until 1819. This was one reason for Sheffield's specialisation until then in small, high value products.

South Yorkshire had a network of packhorse roads, including moorland routes west over the Peak District and Pennines, notably for salt from Cheshire. From 1740 the roads were improved under the turnpike system. Sheffield and Rotherham were connected by railway in 1838, and the North Midland Railway linked Rotherham to the growing national system in 1840. Sheffield had a line across the Pennines to Manchester in 1845, but no direct route to London until 1870. The Great Northern Railway reached Doncaster in 1848-9 and chose the town for its locomotive works in 1851, while Barnsley was linked to the railway system in 1850.

2 Improved transport played an essential part in the radical changes that took place between about 1860 and the First World War. These were arguably at least as far-reaching in this area as the changes of the Industrial Revolution.

In Sheffield, steel works were choosing sites by the Canal in the 1820s and by the Sheffield and Rotherham Railway from 1845. Bessemer's converter, invented in 1855, transformed the steel trade; for the first time steel was available in large quantities and at low prices. Sheffield became a major centre of heavy industry including heavy engineering.

The skills of crucible steelmaking, and the new scientific study of metallurgy, both contributed to the development of alloy steels for special purposes. Sir Robert Hadfield was the leading figure in this area, while stainless steel, invented by Harry Brearley in 1913, is known to everyone. Much of the bulk mild steel trade went over a period to orefield sites like Scunthorpe and Corby, and coastal areas like South Wales, Teesside and West Cumberland, while Sheffield and Rotherham continued as a centre for high quality steels for engineering and other special uses.



Edge tools and silverware: Becketts gable (site H10) and James Dixon's Cornish Place works (G23) from Ball Street bridge, Sheffield

Photo: Ken Webster

The canals, and even more the railways, opened new markets for South Yorkshire coal, and encouraged a rapid development of coalmining. Pits became larger and deeper, and from the 1890s they began to be sunk in the concealed coalfield. Doncaster became for the first time a centre for a mining area, and "model" colliery villages like Bentley and Woodlands were built. New railways were built to compete for coal traffic, like the Hull and Barnsley (1885 on), or serve the new pits, like the South Yorkshire Joint Railway (1909). The same period saw the mechanisation of the cutlery, edge tool and glass trades, using steam or gas engines. By the 1890s the electric motor could be used to power individual machines and replace the shafts and belts which carried power from a central source. Electricity was used to light local works from 1881, to power trams in the area from 1899, for cutting coal around the turn of the century, and for steelmaking in the first decade of the 20thC. Road transport was transformed by the development of the internal combustion engine.

Recent years have seen further great changes. More steel is made than ever, though in a few large works and by many fewer people. The steelmaking and working skills of the remaining firms are an important resource for the British engineering industry and for the region. But Sheffield's Lower Don Valley has lost most of its heavy industry through closures. Coalmining was concentrated in a small number of large pits, mainly in the concealed coalfield. The closures of the 1980s and 90s have left very few pits, and created severe economic and social problems over much of South Yorkshire.

In Sheffield a much reduced cutlery industry produces largely for the top end of the market, and mergers and closures have left only a handful of edge tool firms. Manufacturing still represented 40% of Sheffield employment 25 years ago, but now it is below 20%. During this de-industrialisation many historic sites have been cleared, and some important monuments lost, such as the Holmes cementation furnaces in Rotherham, the remaining linen mills in Barnsley, and Bessemer's 1858 works offices in Sheffield.

Like other similar areas, South Yorkshire is trying to tackle its economic problems by improving its infrastructure and particularly its roads, and developing new service and manufacturing industries. There are some good examples of industrial buildings which have been converted to new uses. Sheffield is having some success in becoming more of a centre for business, finance and administration than in the past. It has built high quality sports facilities for international events and, of course, its Supertram. Tourism is growing in an area that seemed unpromising for it until recently, and the industrial archaeology described in this book

LAND DRAINAGE

A1 TUNNEL PIT

(near Wroot), Hatfield Moors, Doncaster MB
SE 735040 ❖

Large areas N and E of Doncaster are artificially drained. This began with Vermuyden's drainage of Hatfield Chase (1626 on), which provoked riots, and his cutting of the Dutch River to drain the Don to the Ouse near Goole. It was continued by famous engineers such as John Smeaton, James Brindley and William Jessop, and others like local engineer and botanist Thomas Tofield (1730-79). At Tunnel Pit Vermuyden carried the diverted river Torne over the 'New Idle', a drain replacing N branch of Idle that he had dammed off. Now much altered, but the flat farmland and drains recall the work of these engineers.

A2 KIRK BRAMWITH PUMPING STATION

Kirk Bramwith, Doncaster MB
SE 618115 ■

Built 1878 to pump flood water from low lying levels into River Don. Eastons & Anderson beam engine to 1943, Allen 2-cyl compound vertical steam engine to 1961, then two Ruston 6VCB 300hp diesel engines in extended 1878 building. Other pumping stations in area electric in modern buildings, some to deal with effects of mining subsidence.

FARM ENGINE HOUSES

Farm buildings are too large a subject to cover here, but the use of power on farms calls for a mention. 19thC maps mark horse engine houses at most large arable farms, and a good number

survive - some ruined, and some altered as parts of house conversions. Only a few can be mentioned. Two farms have chimneys which suggest use of steam power.

A3 OAKS FARM

Darton, Barnsley MB
SE 318102 ■

Stone and brick horse engine house, half-octagon, attached to 17thC stone barn and used as store.

A4 BROOK FARM

Wath upon Dearne, Rotherham MB
SE 433009 (from footpath on former canal towpath) ❖
Brick half-octagon horse engine house.

A5 NORTH FARM

Letwell, Rotherham MB
SK 562870 ❖
Less common square horse engine house, stone, early 19thC.

A6 NORTON PRIORY

Norton, Doncaster MB
SE 545158 ❖
Two adjoining farms each have a horse engine house. Complete building at E one, bases of walls at W one.

A7 WENTWORTH CASTLE

Stainborough, Barnsley MB
SE 320033 ■
Round brick chimney among derelict buildings of Home Farm.

A8 BROOM HOUSE

Broomhouse Lane, New Edlington, Doncaster MB
SK 546990 ❖
Brick chimney built on to limestone barn.



A3: Horse engine house, Daks Farm, Darton

Photo: Harold Taylor

CORN MILLING

The abundant water power of the W part of South Yorkshire drove many corn mills, often small, as well as forges, rolling mills, grinding wheels and other industrial sites. There were larger corn mills on the Don, Dearne and Rother and the streams flowing E from the Magnesian limestone. The flat area N and E of Doncaster relied on windmills and most of the surviving towers (none with sails) are there, but they were also once found in the rest of South Yorkshire. A number of steam corn mills were built in the 19thC, mainly in towns. These examples illustrate the variety of mills in the area.

WATER CORN MILLS

A9 WORSBROUGH MILL

Worsbrough, Barnsley
SE 350034

LSII □

c1625 on Domesday site. Steam mill added 1843, worked to 1922. Water mill operated to 1960s. Stone buildings, cast iron overshot wheel, small dam beside much larger Worsbrough canal reservoir. Restored to working order and opened as museum 1976; see Z9.

A10 GUNTHWAITE MILL

Gunthwaite, Barnsley MB
SE 249063

LSII ❖

17thC(?) for Gunthwaite Hall, ground animal feed to 1956. Stone, slate roof. Stone lined dam, frame of 20ft backshot iron wheel, machinery in situ. Also drove a sawmill.

A11 PRIORY MILL

Grange Lane, Monk Bretton, Barnsley MB
SE 372063

LSII ❖

Founded before 1200 by Cluniac monks of Monk Bretton Priory, present stone building 1635 by Sir Richard Armyne (initials and date over door). Watercourses filled in, converted to pub-restaurant 'The Mill of the Black Monks'.

A12 ADWICK MILL

Mill Lane, Adwick-le-Street, Doncaster MB
SE 541089

LSII ❖

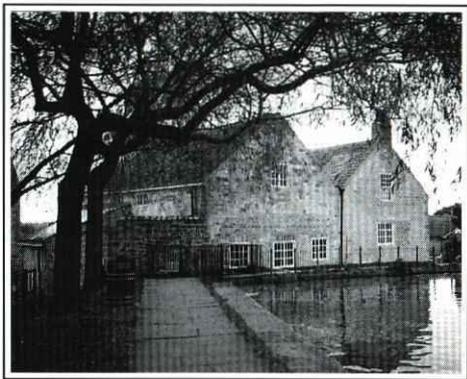
Built 1780s, steam power added by 1842. Three storey, limestone and brick. Wheelpit in tunnel under mill house. Pond and watercourses filled, mill converted to house but some machinery retained inside. Long watercourse, Mill Dike, from Ea Beck to River Don, also powered Bentley Mill (gone); was it natural or artificial?

A13 BURGHWALLIS MILL or SKELLOW MILL

Mill Lane, Skellow, Doncaster MB
SE 528108

LSII ❖

Complex of two and three storey limestone rubble



A14: Tickhill Mill

Photo: Douglas Oldham

buildings, now in other use. Dams and watercourses upstream.

A14 TICKHILL MILL

Castle Gate, Tickhill, Doncaster MB
SK 592928

LSII ❖

18thC, limestone with pantile roof, on older site close to castle ruins. Once two mills working independently; E mill had breast shot wheel and two pairs of stones, W mill four pairs of stones. Banked dam, E wheelpit, site of W sluice can be seen. Building converted to house 1992, some machinery retained.

A15 STONE MILL

Roche, Rotherham MB
SK 555897

LSII ❖

Iron forge here in 17thC. Mill ground corn for Firbeck estate, then animal feed until 1930s. Limestone, pantile roof; part built as extension 1695 has arch for wheelpit. Dam silted, now garden; overflow still there. Three other mill sites round Roche Abbey, at SK 551898 ❖ (forge in 17thC, outbuildings now house, signs of wheelpit and dam); SK 542902 ❖ (mound by bridge); and SK 544897 ❖ (tunnel entrance LSII).

A16 BEDGREAVE MILLS

Rother Valley Park, Rotherham MB
SK 453827

LSII □

Old mill is small early 17thC single-cell building, awaiting restoration. Cottage was used for kiln drying of grain. New mill built c1768, converted to steam c1886 because water from mill race seeping into mine workings, closed 1947. Now visitor centre, open to public when Park is open, machinery restored, exhibition about history of Mills and area.

A17 KNOWLE MILL

Station Road, Halfway, Sheffield
SK 434814

❖

Built late 18thC for sickle grinding, 1823 grinding

bones for fertiliser, then corn mill to 1960s. Large stone and brick building. Mill pond filled in, mill converted to pub (*The Mill*) 1974.

A18 FULWOOD UPPER MILL

Mayfield Road, Fulwood, Sheffield
SK 294848

Typical upland farm mill on small stream. 17thC, two, later three, pairs of stones. Empty by 1884. Dam silted, wheelpit and stone buildings. Few signs of Nether Mill immediately downstream.

A19 MALIN BRIDGE MILL

Holme Lane, Malin Bridge, Sheffield
SK 325894

Grinding wheel by 1739. Used as base in second half of 19thC by Butler, Wild, and German Wilson, millwrights, with water powered sawmill. Damaged by 1864 Flood (L18). Corn mill by 1905. Undershot wheel in poor condition, buildings now restaurant.

WINDMILLS

A20 OATES' MILL

North Eastern Road, Thorne, Doncaster MB
SE 686137

The last of seven windmills in Thorne; six stood in line along this road. 1815, latterly steam. Four storey brick tower, no cap. Empty and neglected.

A21 SYKEHOUSE MILL

Sykehouse, Doncaster MB
SE 625173

1865, replacing post mill. Worked to 1935 when sails blew off. 1911 oil engine from here now at Worsbrough Mill Museum (Z9). Tall five storey tower, converted to house 1972. Cap gone, lookout added on roof.

A22 CANTLEY MILL

Mill Lane, Cantley, Doncaster MB
SE 632017

Tower, brick on limestone footings, datestone **W.C. 1820** (William Carr). Freestanding brick chimney (from drying kiln?), datestone **W.C. 1845**.

A23 ROUND HOUSE

Clayfields Lane, Wentworth, Rotherham MB
SK 392982

Stump of windmill, built 1745, converted to house 50 years later. Brick, castellated top. This and Wentworth Mill (SK 378986 ❖ stone, now house) are the only windmill towers left in South Yorkshire outside Doncaster MB.

STEAM CORN MILLS

A24 STEAM MILL

Peel Street, Barnsley MB
SE 343063

'New' in 1828, an early example for area. Four storey, sandstone.

A25 ALDHAM CORN MILL

Wombwell, Barnsley MB
SE 386043

Mid 19thC, sandstone, three floors, flagstone roof, brick chimney. Two stone cottages attached. Now farm buildings for Aldam Farm.

A26 ELSECAR MILL

Wath Road, Elsecar, Barnsley MB
SE 387002

Built 1841-2 by 5th Earl Fitzwilliam. Stone, with timber granary hoist.

A27 AIZLEWOOD MILL

Nursery Street, Sheffield
SK 355881

Built for John Aizlewood 1861 to design by Flockton & Son. Six storeys, brick. Once had bridge over Spitalfields to Bridgehouses goods depot to bring in corn from Aizlewood's Lincolnshire farms. Closed 1984, converted to offices for co-operative organisations.

A28 THE LEADMILL

Leadmill Road, Sheffield
SK 358866

19thC steam flour mill converted 1980-82 to community arts centre. Name comes from water powered white lead mill, formerly on site across road.

A29 HIND'S CHAMBERS

Fieldside/Field Road, Thorne, Doncaster MB
SE 686134

19thC steam flour mill of Sim Templeman, now shops and offices. L-shaped three storey brick block, pantile roof.

OTHER FOODS

A30 MIDLAND CONFECTIONERY WORKS

behind 631 London Road, Heeley, Sheffield
SK 351848

Built c1879 by William Pike. Later bakery, now empty. Three storey gabled building with projecting canopy and round brick chimney.

A31 TREBOR BASSETT

Livesey Street, Owlerton, Sheffield
SK 3390

South Yorkshire has a sweet tooth and famous brands of sweets have begun here, such as Parkinsons Butterscotch and Nuttalls Mintoes (both Doncaster), Thorntons chocolates and toffees (originally Sheffield) and Bassetts liquorice allsorts. Bassetts founded c1842, 'the foremost confectionery business in England' by George Bassett's death in 1886. Liquorice allsorts reputedly invented by accident 1899 when salesman dropped tray of samples. This site begun by subsidiary 1900 mak-

ing candied peel, greatly expanded over years, all production here 1941. Bertie Bassett launched 1929. Successive mergers, Cadbury Schweppes takeover 1989, Trebor Bassett 1990. Oldest buildings including 1924 former General Offices in Beulah Road.

A32 HENDERSONS RELISH

Leavygreave Road, Sheffield
SK 345873 ❖

Sheffield's answer to Worcestershire Sauce made in this area by Hendersons (Sheffield) Ltd since 1889, came c1960 to this two-storey works.

MALTINGS

A33 BARNBY DUN MALTINGS

Station Road, Barnby Dun, Doncaster MB
SE 617083

LSII ❖

Large commercial maltings, late 19thC, enlarged 1924. Red brick, three storeys, 23 bays. Two transverse roofs project as canopies over hoists by railway sidings. Now in other use. Smaller maltings N of Barnby Dun at SE 616101 ❖

A34 HOLYWELL BREWERY MALTINGS

Sheffield Road, Conisbrough, Doncaster MB
SK 512982 ❖

Plain brick range, second half of 19thC. Now Braim & Cooper, 'The Frier's Suppliers'. Nicholson Bros' Holywell Brewery, N and across road, closed 1909 and has gone.

A35 MASBROUGH MALTINGS

Masbrough Street, Rotherham MB
SK 424929 ❖

Malthouse on 1850 map. Mid 19thC and later

buildings, older N side of stone, two and three storeys. Whitworth Son & Nephew 1860-1913; their brewery was at Wath on Dearne where outbuilding survives (SE 435010 ❖) and Spedding Whitworth was a local benefactor.

BREWERIES

Once a large industry in the area, but only Ward's Sheaf Brewery (A42) and Stone's 1960s Cannon Brewery in Rutland Road, Sheffield, and a few small recent real ale breweries, are still active.

A36 OAKWELL BREWERY

Pontefract Road, Barnsley MB
SE 357063 ❖

Barnsley Brewery Co founded 1861, famous for 'Barnsley Bitter'. Taken over by John Smiths Tadcaster Brewery 1961 and soon closed. Four storey stone brewing tower, other stone buildings, brick chimney, iron gates inscribed 'Barnsley Brewery Co Ltd'.

A37 IVY BREWERY

Church Street, Darton, Barnsley MB
SE 311099 ❖

Built for Halls c1900, closed by 1910, later used as vinegar brewery and pickle factory, now Ivy Motors. Plain three and four storey brick tower with roof ventilator.

A38 HILL TOP BREWERY

Sheffield Road, Conisbrough, Doncaster MB
SK 496975 ❖

Francis Ogle, c1857-81. Buildings behind farmhouse, brick tower and limestone outbuildings.

A39 DARLEYS BREWERY

King Street, Thorne, Doncaster MB
SE 687134 ❖

Charles Darley here by 1837, present buildings turn of century, closed 1986. Only five storey tower, a landmark, and adjacent offices survive.

A40 MASBRO OLD BREWERY

Greasborough Road, Rotherham MB
SK 427932 ❖

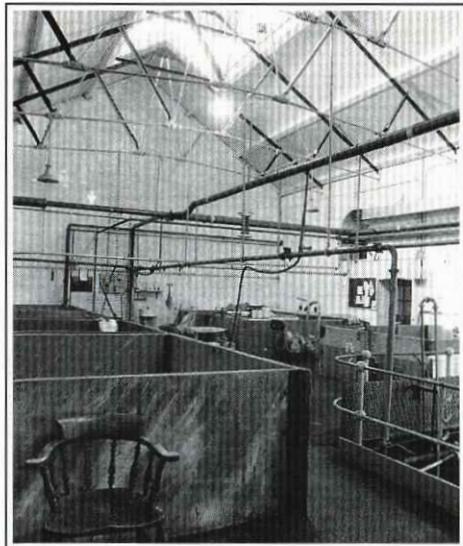
Founded c1835. John Newton Mappin (related to Mappin & Webb silverware family) bought 1840s, died 1884, left paintings and money to found Mappin Art Gallery, Sheffield. Brewing ended 1958. Stone front range survives, now Bestobell Valves.

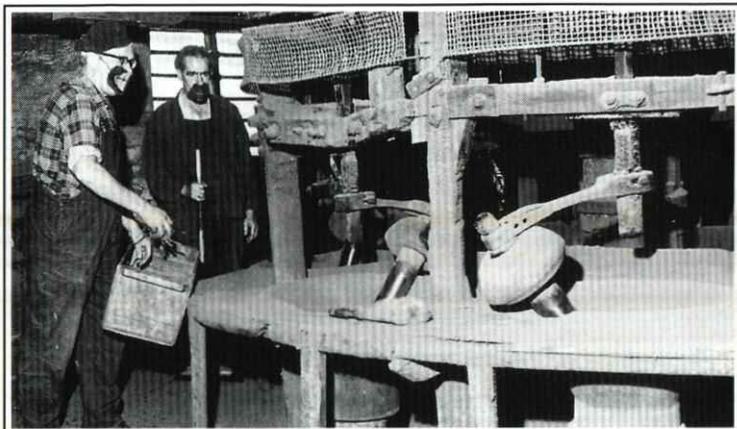
A41 EXCHANGE BREWERY

Bridge Street, Sheffield
SK 356878 ❖

Tennant Bros founded 1820, moved here 1852. Merger with Whitbreads 1962, large expansion in 1980s but closed 1993. Buildings largely 1870s, 7

A39: Brewing in Yorkshire Squares (1986) at Darleys Brewery, Thorne
Photo: Simon Robinson





A45: Grinding snuff (1967) in the water powered mills at Sharrow Mills, Sheffield
 Photo: Sheffield City Libraries

mostly three storey ranges to Bridge Street and River Don, where part stands over river on iron columns. Two ornate gateways inscribed 'Exchange Brewery' with sheaves of corn. Five storey brewing tower. Good interior with copper mash tun, king post roof trusses, etc. Current proposals for reuse.

A42 SHEAF BREWERY

Ecclesall Road, Sheffield
 SK 346863

❖
 Soho Brewery of Bradley & Co by 1837. Wards set up 1840, here early 1870s bringing Sheaf name, acquired 1972 by Vaux. Brick brewing tower 1874, five storeys, still in use. Stone buildings c1850 can be seen from Hallamshire Business Park. Entrance gateway with large sheaf of corn, moved and rebuilt in early 1980s.

A43 CROWN BREWERY

Langsett Road, Sheffield
 SK 341887

❖
 1864, closed 1910. Stone at front, brick and render to side and rear. Tower and three storey block at rear, ashlar chimney. Now Kelvin Scrap & Salvage Co. An impressive group in need of repair.

A44 HIGH HOUSE BREWERY

Barnforth Street, Hillsborough, Sheffield
 SK 339894

❖
 Small brewery of Deardens 1833-1901, then bottling for Gilmours for some years. Stone and brick buildings, round stone chimney.

SNUFF

A45 SHARROW MILLS

Ecclesall Road, Sheffield
 SK 339858

LSII ❖
 8 (view from Sharrow Vale Road and footpath off it) Wilsons & Co (Sharrow). Grinding wheel by 1604. Thomas Wilson, shearsmith, leased 1738, Joseph

Wilson introduced snuff grinding in 1740s. New snuff mill 1763, steam power 1796, mainly electric power since 1956, but water powered snuff mill still in use. Head goit, dam, 19ft wheel. Unusual 1750s tail goit culverted under River Porter to give greater fall at wheel. 18th and 19thC buildings, 1954 addition. Snuff flavoured in secret behind locked door. Smell of snuff overpowering to those not used to it.

A46 WESTBROOK MILL

Sharrow Vale Road, Sharrow, Sheffield
 SK 341858

LSII ❖
 J & H Wilson set up after family quarrel at Sharrow Mills and built this steam powered mill, 1831 with later extensions. To Imperial Tobacco 1953, closed 1989. Stone buildings, now offices. Pedimented facade to N (away from road). Oven Room on first floor with round brick vault.

WOODLANDS AND TIMBER

Many of the area's woods were exploited on a very large scale for timber and charcoal. This was used in great quantities for iron smelting until the late 18thC, and on a smaller scale into 20thC for cementation furnaces and other uses. Timber was used for building and other uses, and large amounts of wooden rails went to Tyneside in 18thC for waggonways.

A47 ECCLESALL WOODS

Abbeyle, Sheffield
 SK 3282, 3283 etc

□
 Contain over 80 'Q-holes', round embanked hollows with spout on downhill side. These were kilns to make whitecoal or kiln-dried wood for lead smelting in 17th and 18thCs, though the view that they were early coke ovens still finds supporters. (They are also found in some other woods in the area.) One stands by short footpath across E angle

of Whirlowdale Road and Abbey Lane (SK 323825 to 325826). Just off this is a stone memorial of 1786 (with iron railings) to George Yardley, a woodcollier or charcoal burner, burned to death in his cabin. A charcoal burning platform adjoins this. Depressions at N end of path may be from small coal or ganister mine.

A48 GRENO WOODS

Grenoside, Sheffield
SK 333946



Sharp family made baskets from hazel, willow, or riven oak for four generations to 1930s. Restored stone lined pond is 'wood 'oil' (hole) where they soaked willow rods before basket weaving.

A49 CANNON HALL SAWMILL

Bark House Lane, Cawthorne, Barnsley MB
SE 273078

LSII ❖

Or Jowett Mill. Corn mill by 1587, rebuilt 1858 with large wheel as estate sawmill, disused 1950s, now house.

A50 DON SAWMILLS

Savile Street, Sheffield
SK 361881



Firm of Henry Matthews here since 1870s at least. Brick 19thC buildings include timber store with slatted openings.

3 COAL

Coal has been mined in South Yorkshire at least since the 13thC. The Fitzwilliams of Wentworth were involved by the 14thC and the Earls of Shrewsbury around Sheffield by the 15thC. The Shrewsbury estates later passed to the Dukes of Norfolk whose Superintendent of the Coal Works in the late 18thC, John Curr (1756-1823), developed flanged iron rails for use underground and guides in the shaft to help in raising the coal.

In this hilly area much early mining was by drift rather than vertical shaft, and there were drift mines at Thorncliffe until 1955 and at Goldthorpe Colliery, 1956-94. Bell pits, a vertical shaft with a roughly circular excavation from its foot, were used in the Middle Ages and widely in the 18th and early 19thCs, but more often for ironstone than for coal.

As the exposed coalfield became fully exploited the concealed coalfield below the Magnesian limestone was worked from the 1890s. This called for deeper pits and greater capital. Iron and steel firms, heavy users of coal and coke, invested in coal mines; eg John Brown sank Rotherham Main 1893, and the Markham family of Staveley Coal & Iron Co sank pits in the concealed coalfield such as Brodsworth and Markham Main.

Provision of colliery baths followed the Mining Industry Act 1921. The Miners Welfare Committee visited Europe in 1927 to see baths there, and were impressed by the Modern Movement architecture influenced by the Dutchman W M Dudok. Baths were built in this style in the 1930s and 40s, the main architects being C G Kemp and W A Woodland. The baths are long low buildings of red-brown rustic brick, with bands of metal windows and tall water towers, often continuously glazed on the staircase elevation.



Old pillar and stall workings
revealed by opencasting,
Tinsley, Sheffield in 1990

Photo: Simon Robinson

Many colliery owners provided housing for the miners. At first this was on a small scale as at Hemingfield, but larger settlements range from the Fitzwilliams' model housing at Elsecar to the 20thC estates on the concealed coalfield. Some examples are mentioned at the end of the section.

A 1929 map of the South Yorkshire Coalfield in the 'Sheffield Daily Telegraph' showed 73 collieries; 50 years earlier there would have been many more, though they would have been smaller. By 1990 there were 21, though many produced more than a million tons a year. The latest round of closures has left only five (Maltby, Rossington, Markham Main, Hatfield and Thorne) working or under development, all on the concealed coalfield. Most recently closed collieries have been systematically obliterated except for the triangular concrete pillars marking the shaft.

B1 NEWCOMEN ENGINE

Distillery Side, Elsecar, Barnsley MB
SK 386999

SAM ❖

The only Newcomen atmospheric engine in the world in its original engine house. 1795 (despite 1787 datestone), to pump Earl Fitzwilliam's Elsecar New Colliery. Cylinder and other parts from Thorncliffe iron works (D16). 6-8 working strokes a minute; steam condensed by spraying water in cylinder. Wooden beam replaced by cast iron one 1836. In continuous use to 1923, workable to 1953, boiler gone, awaiting restoration. It contrasts with adjoining mid-20thC brick electric pumping station.

B2 ELSECAR WORKSHOPS

Wath Road, Elsecar, Barnsley MB
SK 385999

LSII □

Established 1850 on advice of John Hartop, manager of Elsecar Ironworks, to centralise maintenance for Earl Fitzwilliam's industrial enterprises. When Ironworks closed 1884 some of its buildings were added (see D15). Closed by NCB 1986, bought by Barnsley Council, now 'Elsecar at Barnsley' (Z2). Most buildings 1850s including pillared Machine Shop now The Powerhouse and adjoining

sawmill. 'Elsecar People' exhibition in Earl Fitzwilliam's station of 1870 for private trains on South Yorkshire Railway's 1850 mineral branch.

B3 FOOTRILL

off Forge Lane, Elsecar, Barnsley MB
SK 385996

LSII ❖

Stone lined pedestrian mine entrance, early 18thC? Another in garden of Footrill Cottage, SK 371994 ❖.

B4 LIDGETT COLLIERY

by A6135, Hoyland Common, Barnsley
SK 364990

❖

Sunk 1879, closed 1911. Brick engine house now garage, spoil tip beyond.

B5 HEMINGFIELD COLLIERY

Hemingfield, Barnsley MB
SE 393009

❖

Sunk 1842-3 for Earl Fitzwilliam. Stone engine house with gabled roof, flat roofed stone building now a house. Small concrete headgears for recent use as pumping pit. Row of eight cottages across lane. Large basin and wharf laid in ashlar blocks on branch of Dearne and Dove Canal; water from mine fed into this until recently.



10

B1: The 1795 Newcomen engine house at Elsecar

Photo: Ken Webster

B6 TANKERSLEY RESCUE STATION

on A61, Birdwell, Barnsley MB
SE 347005

❖
1902 datestone. Believed to be first purpose built mines rescue station away from colliery. Two storeys, brick, half timbered gable. Opposite is remaining building of Birdwell central workshops (closed 1985), early 20thC for Newton Chambers collieries with stepped and patterned brickwork.

B7 STRAFFORD MAIN COLLIERY

Dodworth, Barnsley MB
SE 322041

❖
Remains of Guibal fan and fanhouse. At New Sovereign Colliery (SE 312043 ■) remains of late 19thC stone pumping engine house.

B8 NATIONAL UNION OF MINeworkERS HQ

Huddersfield Road, Barnsley MB
SE 343070

LSII ❖

Opened 1874 as South Yorkshire Miners Association offices. Stone, two storeys, French Gothic style with prominent corner 'apse'. Architects Wade and Turner. In grounds a Gothic monument to leading members including John Normansell, general secretary 1864 to death 1875.

MINING DISASTER MEMORIALS

Barnsley MB

B9 Huskar Pit Memorial, Silkstone churchyard SE 291058 □ LSII 26 children aged 7 to 17 drowned by inrush of storm water 1838. Cube of sandstone inscribed with names and ages, below tapering pillar.

B10 Oaks Colliery Memorial, Ardsley churchyard SE 350056 □ Gothic obelisk erected by public subscription to 354 miners killed in 1866 explosion including 35 buried here.

B11 Oaks Colliery Memorial, Doncaster Road, Kendray SE 362057 □ LSII Near colliery site. Obelisk and bronze statue of angel supporting body, architects Wade and Turner. 1913 to mining engineer Parkin Jeffcock and other rescuers who died in disaster.

B12 Lundhill Colliery Memorial, Darfield churchyard SE 419043 □ LSII 189 miners killed in explosion 1857. Tall obelisk on ashlar plinth.

B13 Swaithe Main Colliery Memorial, St Thomas' churchyard, Bank End Road, Worsbrough Bridge SE 358043 □ LSII 143 miners killed in explosion 1875. Gothic stone monument in three stages with cross, carvings of mine tub and miners' tools.

B14 BARNsLEY MAIN COLLIERY

Oaks Lane, Barnsley
SE 365063

❖
Closed 1991. Brick building with gabled roof and

steel headgear, from 1980 resinking but in traditional style.

B15 NEW MONKTON COLLIERY AND COKING PLANT

Royston, Barnsley MB
SE 374120

❖
Colliery converted to drift mine 1970, reserves exhausted by 1989. Tall concrete winding house. Adjoining it the concrete silos and gantries of last operating coking plant in South Yorkshire, rebuilt 1976-9 with 42 ovens. Periodic plume of steam as red hot coke is quenched. Coke played an essential part in area's iron, steel, chemicals, gas and other industries over more than two centuries until recently.

B16 HICKLETON MAIN COLLIERY

Thurnscoe, Barnsley MB
SE 465053

❖
Sunk 1895, closed 1988. Site clearance has left a chunky mid-20thC concrete headgear, with integral winding house to enclose shaft head for ventilation seal.



B9: The price of coal: Huskar Pit memorial in Silkstone churchyard

Photo: Valerie Bayliss

B17 MANVERS MAIN COLLIERY

Wath, Rotherham MB
SE 455007

Sunk 1868, largest mine and coking plant complex in South Yorkshire. Closed 1988. All now gone except baths on Golden Smithies Lane, 1937 by Kemp. Water tower has projecting semicircular window of glass blocks reminiscent of 1930s Odeon cinemas.

B18 WESTFIELD PUMPING STATION

Westfield Road, Rawmarsh, Rotherham MB
SK 434954

LSII ❖

1823 Newcomen engine house with gabled roof, for Earl Fitzwilliam. Engine claimed to be most efficient atmospheric engine ever built, replaced by electric pumps 1926, dismantled 1934. Boiler house and workshop attached. Lodge at entrance. Former stables opposite, now houses, and Westfield House once the manager's house.

B19 CAR HOUSE COLLIERY

Greasbrough Road, Rotherham MB
SK 423939

❖

Sunk 1856, closed c1920. Two brick engine houses from deepening of colliery in 1876 (hipped roof) and 1891 (gabled roof). Both three bays square, round arched windows in recessed brick panels.

B20 ROTHERHAM MINES RECUE STATION

St Ann's Road, Rotherham MB
SK 431937

❖

1914, twin gabled front, Arts and Crafts style in brick and stucco. Recently converted to flats.

B21 SILVERWOOD COLLIERY

Rotherham MB
SK 478940

❖

Sunk 1903, now linked underground with Maltby, demolition has begun. Offices, workshops, NUM office, landsale depot all original buildings with gabled roofs and Florentine windows set in recessed brick panels. Baths 1936 by Kemp. War memorial in form of lighthouse moved to Vale Road, Thrybergh (SK 466949 □).

B22 DINNINGTON COLLIERY

Dinnington, Rotherham MB
SK 517867

❖

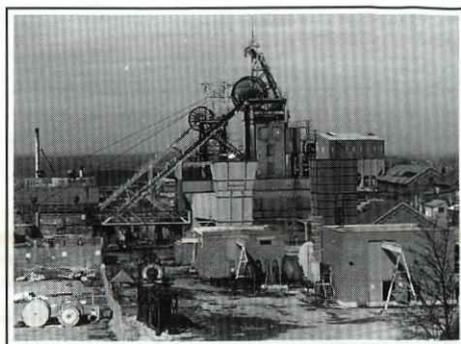
Opened 1905, closed 1991. Only the baths are left. By Kemp 1932, oldest in area in modern style.

B23 MALTBY MAIN COLLIERY

Maltby, Rotherham MB
SK 551925

❖

Sunk 1910. £180m rebuilding 1981-8 including 230ft concrete winding tower, tallest in country, with two 4000hp engines. Also older buildings, steel headgear, baths 1938 by Woodland, screens, coal



B21: Silverwood Colliery, Rotherham

Photo: Ken Webster

preparation plant, concrete bunker for merry-go-round trains. Landsale depot is also base for miners' home coal transport. Now only working colliery in borough.

B24 KIVETON PARK COLLIERY

Kiveton Park, Rotherham MB
SK 489826

❖

Sunk 1867, closed 1994. Only colliery offices, 1872-5 in Gothic style with tall turreted clock tower, and baths, canteen and medical centre, 1938 by Woodland (both LSII), have survived recent demolition.

B25 HANDSWORTH NUNNERY COLLIERY

Handsworth, Sheffield
SK 410869

❖

There is little to see on the surface from Sheffield's centuries of coalmining history, though the city centre is built over abandoned mines. This pit sunk 1903, closed early 1970s. 1921 pithead baths in traditional colliery style with gabled roof and small paned windows, now factory. Manager's house at entrance. To north several spoil heaps, not landscaped (a rarity) and weathered to a red colour.

B26 MOORHOLE COLLIERY

Moor Valley, Mosborough, Sheffield
SK 413824

❖

Sunk 1855, closed c1900. Engine house and weigh-house now garage workshops. Formerly 70 coke ovens here. Terrace of late 19thC miners' cottages with diamond-paned windows and diagonally set chimneys, Diamond Row, SK 411824 ❖.

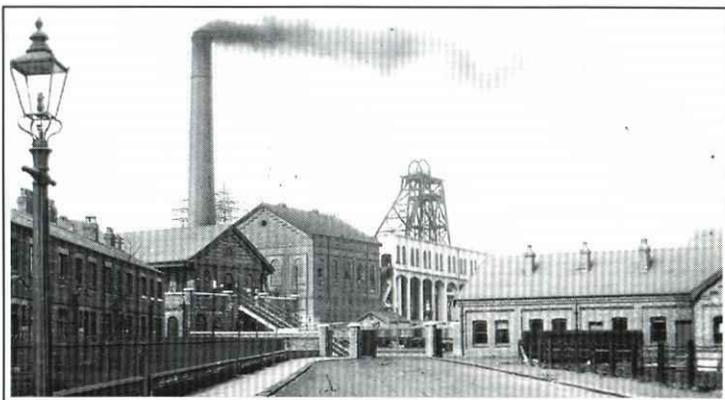
B27 DENABY MAIN COLLIERY

Denaby, Doncaster MB
SK 494997

❖

1868, closed 1968. Only the baths left, part used by British Coal archives. 1948 by Woodland, with porthole windows.

B29: Early view of Bentley Colliery, Doncaster.
left to right: lamp house, chimney with headgear under construction behind, engine house, other headgear, offices
Photo: Doncaster Library and Information Service



B28 DONCASTER MINES RESCUE STATION

Wheatley Hills Road, Doncaster MB
 SE 583045 ❖

Only operational rescue station in South Yorkshire. Arts and Crafts style in brick and stucco, twin gabled front inscribed **DRS 1913**. Simulated 'underground' rescue training area.

B29 BENTLEY COLLIERY

Bentley, Doncaster MB
 SE 570075 ❖

Sunk 1905-8, closed 1994. Interesting early examples of Hennebique ferroconcrete construction with steel headgear. All demolished during 1995.

B30 MARKHAM MAIN COLLIERY

Armthorpe, Doncaster MB
 SE 616046 ❖

Sunk 1916-24 by Staveley Coal & Iron Co. Chequered recent history, closed 1992 and some buildings gone but now working. Power house of concrete blocks inscribed **MM 1920** once had steam winding engine houses on ends. Baths 1938 by W M Traylor.



B32: Sinking the shafts at Hatfield Colliery, Doncaster

Photo: Doncaster Library and Information Service

B31 ROSSINGTON COLLIERY

New Rossington, Doncaster MB
 SK 601984 ❖ (part)

Sunk 1916, working. Two prominent steel headgears c1960 enclosing original headgear of lattice steel filled with brick. no.1 Engine House 1915. Still has a tall round brick chimney. Baths 1938 by Woodland.

B32 HATFIELD MAIN COLLIERY

Stainforth, Doncaster MB
 SE 653113 ❖

Sunk 1911-17, working. Original brick office block and other buildings. Baths 1933 by Kemp. 1980s coal preparation plant and tower by railway for loading merry-go-round trains.

B33 THORNE COLLIERY

Moorends, Doncaster MB
 SE 705160 ❖

Sunk from 1910, endemic water problems, reinforced concrete shaft (also at Hatfield). 1910 brick power house and stores. Opened 1927, closed 1956 due to flooding. New development from 1979, two new winding houses and two unusual 'Tetrapod' headgears which won award (1983) from



B33: 1910 power house and stores and a tetrapod with its engine house, at Thorne Colliery

Photo: Ken Webster



B34: 1853 Miners' Lodging House, Elsecar
 Photo: Ken Webster

Institute of Structural Engineers. Now linked underground to Hatfield Main.

COLLIERY SETTLEMENTS

B34 ELSECAR

Barnsley MB
 SK 3899-SE 3800

LSII ❖

Rows of good quality cottages built by Earls Fitzwilliam from 1795, along and off Wath Road. Old Row 1795, Station Row 1800, Reform Row 1837, Cobcar Terrace c1860. Three storey Miners' Lodging House, Fitzwilliam Street, 1853, now flats. National School 1852, Milton Hall 1870 as market hall. Now Conservation Area.

B35 SOUTH YORKSHIRE BUILDINGS

Silkstone Common, Barnsley MB
 SE 295042

❖

Terraces with Tudor details and decorative chimneys, built 1877 by South Yorkshire Coal & Iron Co,

B36 DENABY MAIN

Denaby, Doncaster MB
 SK 5099

❖

Colliery settlement begun 1866. Original housing

gone but public buildings remain – churches, 1893 colliery school in Renaissance style with Moorish dome, Denaby Main Hotel. All Saints Church has a Miners' Memorial Chapel, completed 1987.

B37 WOODLANDS

Doncaster MB
 SE 5308 and around

LSII ❖

Staveley Coal and Iron Co sank Brodsworth Main Colliery 1905-8, then largest in Britain, closed 1991, only modern offices left. Colliery village laid out as garden city; architect Percy Houfton who designed similar settlements for North Derbyshire collieries and at Letchworth. 653 houses along curving avenues of trees, extensive open space. Houses in Arts and Crafts style with Tudor gables and small-paned casement windows. (Similar style used at Dinnington 1905, Maltby Model Village c1910 and New Rossington c1916). Central core of public buildings; 1914 church by W H Wood has prominent spire.

14 C2 (see opposite):
 Millstones at Millstone
 Quarry

Photo: Derek Bayliss



STONE

Millstone grit, Coal Measures sandstone and Magnesian limestone were all quarried for building stone. The Magnesian limestone was nationally famous from the Middle Ages; stone from Cadeby was used in Beverley Minster in the 13thC, from Marr in Westminster Hall 1395, from Roche Abbey and Hampole for Kings College Chapel, Cambridge, and from Anston for rebuilding the Houses of Parliament in the 1830s, though some was not seasoned properly and flaked away. The millstone grit was also used, as its name indicates, for millstones and roofing slates; the sandstones for grindstones; and the limestone for lime and recently for roadstone. Only a few of the many quarries can be mentioned.

C1 QUERN QUARRIES

Wharcliffe Edge, Sheffield
SK 296977

SAM ■

Iron Age and Roman quarries for 'beehive' querns (hand-mills for grinding corn). 'Wharcliffe' means 'quern cliff'.

C2 WILDMOORSTONES EDGE QUARRY

near Fox House, Sheffield
SK 248801-3

□

Access by track above E bank of Burbage Brook. Millstone quarry with complete and partly made millstones scattered about. Also large numbers of completed millstones at Bole Hill Quarry, just in Derbyshire at SK 248793-248880 □.

C3 BROWN EDGE QUARRIES

Ringinglow, Sheffield
SK 276838

□

Extensive, mostly shallow workings for roofing, paving and building stone, pre 1820 to c1900, 40-50 workers at peak. 'Kelly's House' (SK 278835) is ruin of White Path Moss Peat Works c1850, with small engine and boiler, to compress moorland peat for manure, and of house for quarry and coal mine workers.

C4 BRINCLIFFE QUARRIES

Psalter Lane/Quarry Lane, Sheffield
SK 3385 etc

❖

Sandstone quarried in 19thC for cutlery grindstones (Wickersley, Rotherham, was another centre) and 'Brincliffe Blue' stone for windowsills and door-steps. Extensive group of quarries with nine owners 1862; still working 1920s. Pillar of rock in Psalter Lane (SK 329852) was rear wall of 'Salt Box' quarrymen's cottages. Psalter Lane campus of Sheffield

Hallam University partly in quarries; face exposed in (private) car park of Omega Restaurant at SK 330851.

C5 QUARRIES

Green Moor, Barnsley MB
SK 2799-2999

❖ and □

Same stones geologically as at Brincliffe, worked by 18thC, later on large scale. Stone for paving by

sea in 19thC to London where there was a Greenmoor Wharf in Southwark. Later sent by rail from Wortley station where there was a stone sawmill. Green Moor Delf stretching back from Rock Inn (SK 2899 □); Trunce or California Quarry (SK 277998 ■), with remains of stoneway to village (channelled stone slabs for wagon wheels); Victoria Quarry between Well Hill Road and River Don (SK 2899-2999 ■). All largely filled in. Stack of stones left to weather by Well Hill Road just in Stones Wood (SK 290998 ❖). Wagons down to Wortley had six horses in front and six behind. Quarries closed 1936.

LIME

C6 QUARRIES AND KILNS

by Chesterfield Canal, Rotherham MB

Nine beehive lime kilns in very overgrown quarries on S bank of canal, five near Thorp Bridge at SK 514822 and 518821 and four by Pudding Dike Bridge (M14) at SK 527815. 18-20ft internal diameter. All ❖.

C7 NORTH CLIFF STONeway

Conisbrough, Doncaster MB
SK 507993

□

Double track of L shaped limestone blocks with flanges outside wheels, worked as cable incline from quarry to lime kilns which have gone, as has much of track. Post 1850 (not 18thC as has been suggested), closed by 1901.

C8 QUARRIES AND LIME KILNS

Don Gorge between Conisbrough and Sprotborough, Doncaster MB
SK 5299-SE5300

❖ and ■

Limestone quarried and burned from mid 18thC to 1950. Hamlet of Levitt Hagg, population over 100, now disappeared. By 1850 extensive quarries linked to kilns and river wharves by some 15 short tramways; stone lined tunnels under later (1849) railway survive. Fine pair of stone-built kilns at SE 534004 ❖, mid or late 19thC? Remains of other kilns NE and SW of this, some in undergrowth. Large working quarry.

RUDDLE

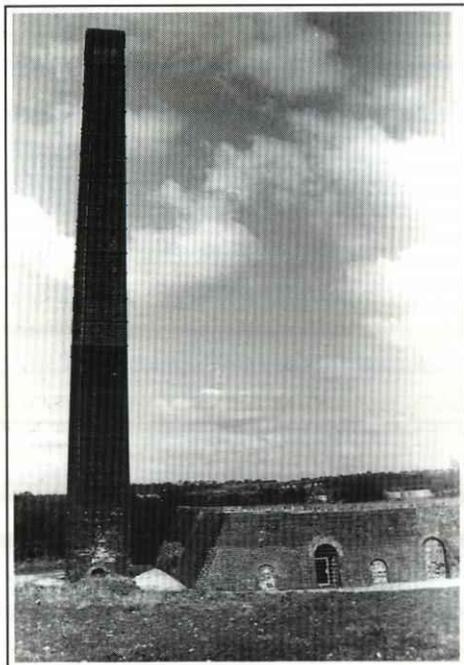
C9 RUDDLE MILL

Braithwell, Doncaster MB
SK 540945

Ruddle, a red ochre, was mined around Micklebring. It was ground and used for paints, colouring (cf the reddleman at start of Hardy's *The Return of the Native*), and polishing in the cutlery trade. Watermill built c1810 on small stream by Union Colour Co to replace several smaller mills. Shares in it still changing hands 1883; later farm, now derelict. On private land.

BRICKS

After the Roman period, bricks were reintroduced around Thorne and Hatfield in mid 17thC and in Sheffield 1700. In 19thC bricks were made at many sites both permanent (over 200 in South Yorkshire since 1840) and temporary. Hoffman or Staffordshire continuous kilns have been used at over 120 sites. The three working brickworks at Grimethorpe, Barnsley; Stairfoot, Barnsley (on pre-1850 site); and Maltby, Rotherham, all use modern tunnel kilns. (On display at Stairfoot is a Ruston Bucyrus excavator rescued from former claypit and a geological display of the Mansfield Marine Band). Little is left of older methods, though some kilns, eg at Thurcroft, Rotherham, may survive buried deep under colliery waste.



C10 HOFFMAN KILN

Aizlewood Road, Heeley, Sheffield
SK 349860

Sheffield Patent Brick Co made bricks here 1879-1910. Later used for car manufacture (F17). Now builders' merchants. Only lower part of kiln remains under modern additions.

C11 PARK HILL BRICKWORKS

Wombwell, Barnsley MB
SE 408031

Oakland Bros, late 19thC to 1960s. Staffordshire kiln and chimney, claypit now fishing pond. Site is nature reserve, being restored by Barnsley Council. Access for groups by arrangement with their Planning Dept (01226 772568).

C12 LEE'S BRICKWORKS

Station Road, Mosborough, Sheffield
SK 427813

Small twin arched intermittent kiln used by Jack Lee, farmer-brickmaker, who later stored his tractors in it.

FIRECLAY

The steel industry has needed refractory clays for Huntsman's crucibles, linings for Bessemer converters, furnace linings, hollow-ware, and casting pit refractories among other uses. Firebricks have also been made but more often come from the Halifax and Leeds areas. Fireclay occurs between the Halifax Hard and Soft coal seams near the W edge of the Coal Measures, and outcrops in the river valleys. There are different varieties such as Pot Clay, Black Clay and ganister. Both opencast and underground mining (usually by drift) have been used. The last underground mine at Marshalls Storr's Bridge works closed 1983. Opencasting ended more recently at Dyson's Loftshaw and Wetslaw mines at c1300ft W of Stannington. Clay is now brought in from the Swadlincote area of Derbyshire. Beehive kilns were used for easy temperature control, but all have now gone. The active works use tunnel kilns in long sheds, or rectangular kilns (Dyson's Griff Works, SK 291887).

C13 BRACKEN MOOR BRICK WORKS

Stocksbridge, Sheffield
SK 2797

Thomas Brook opened works 1854, closed 1928. Gone, claypit is playing fields. Brook's house and workers' cottages Brook Row survive; cottages built of hollow fireclay blocks with decorative embellishments all made at works.

left: C11: Hoffman kiln at Park Hill Brickworks, Wombwell

Photo: Ken Webster

C14 HOLLIN BUSK COLLIERY AND CLAY MINE

Hollin Busk Lane/Cockshot Lane,
Deepcar, Sheffield
SK 277973 ❖

Only fireclay shaft mine to survive. Sunk to coking coal at 108ft and Pot Clay at 261ft. Headgear and winding wheel above spoil mounds.

C15 CLOUGH FIRECLAY WORKS

Carr Road, Deepcar, Sheffield
SK 283978 ❖

Now crane repair yard. Mine staithe (stone piers), office, row of stone workers' cottages. Chimney dated 1891 recently demolished. Steep incline down to Stocksbridge Railway partly followed by footpath.

C16 WHARNCLIFFE WOODS

Wharncliffe Side and Oughtibridge, Sheffield
SK 2993-3094 ■

There were four narrow gauge inclines down from ganister mines to main line railway, two at Oughtibridge (pre 1890) and two at Wharncliffe Side (early 20thC). Sealed adits, stone embankment, stone loading docks by main line.

C17 WHARNCLIFFE FIRECLAY SHOWROOM

Devonshire Street/Broomhall Street, Sheffield
SK 348871 ❖

John Armitage bought existing Henholmes fireclay works, c1852, then expanded at Station Road, Deepcar (now industrial estate with a few later buildings, SK 290981 ❖) and expanded it, specialised in decorative fireclay moulded bricks and ornamental figures, employing artist Peter Nanetti. They are displayed on exterior of this 1888 showroom.

POTTERY

C18 ROMAN POTTERIES

Rossington Bridge, Doncaster MB
SK 632999 SAM ■

Archaeologists have excavated Roman pottery and tile kilns here.

C19 ROCKINGHAM POTTERY

Swinton, Rotherham MB
SK 441989 LSII* □

Pottery and earthenware made 1745-1842, porcelain from 1826. Controlled by Leeds Pottery 1787-1806. Most famous for last period when Brameld brothers had patronage of Earl Fitzwilliam and aimed at highest quality products, noted for decoration, including 200 piece dessert service for William IV. See display in Rotherham Museum. Remained in use 1842-65 to decorate pottery made elsewhere. Flint mill continued 1842-87; then

to 1909 for Isaac and Israel Walker, probably to grind plumbago. Only the large Waterloo Kiln and Pottery Pond remain, and nothing of the other potteries along Don from Rotherham to Mexborough.

GLASS

The Yorkshire glass industry began in the 17thC soon after coal was introduced as a fuel for making glass in place of wood. In 1631 the Earl of Strafford built a glasshouse at Wentworth, close to his seat at Wentworth Woodhouse. It was worked for Sir Robert Mansell who held the glass monopoly, and made window glass, but closed about 1642. About 1650 the Pilmays, descended from French immigrant glassmakers, set up a glasshouse at Silkstone, and the industry has a continuous history in South Yorkshire since then. There were 25 glassworks in South Yorkshire at the close of the 19thC. The main products are bottles, jars and other containers, in contrast to the flat glass of the St Helens industry and fine glassware of Stourbridge.

C20 POT HOUSE

Silkstone, Barnsley MB
SE 293058 ❖

The Pilmays and then the Scotts made glass here c1650-c1720 or later. Two glasshouses, one for bottle and window glass and one for lead crystal. After glassworks closed a pottery was set up nearby, whence the name. Now Silkstone Garden Centre. A building by the road, with bricked up archway on S front, is still being studied but seems to include remains of glasshouse. Also shell of a three-storey corn mill, 17th and 18thC, in use until after 1881.

C21 BOLSTERSTONE GLASSWORKS

Pot House Lane, Stocksbridge, Sheffield
SK 266980 SAM ❖

Glassworks operated by Fox family (no connection with Samuel Fox of Stocksbridge Steel Works) 1650s-1758. It made bottles, window glass and lead flint glass, including decorative tableware. Followed by pottery nearby (1778-96) and farm. Glasshouse building became barn; on W front archway and remains of lehrs (annealing furnaces for controlled cooling of newly made glassware) can be seen from Whitwell Lane. Inside the furnace excavated by Denis Ashurst. They extend beyond the building and show evidence of sophisticated design including use of waste heat to pre-heat incoming air.

C22 CATCLIFFE GLASS CONE

Rotherham Road, Catcliffe, Rotherham MB
SK 425887

SAM and **LSII** □

The glass cone was the next development in glass production after the type of furnace used at Bolsterstone. It enclosed a central furnace and the working area. Denis Ashurst excavated the remains of a cone of 1734 at Gawber N of Barnsley before it was built over. The Catcliffe cone of c1740 is one of only five in the British Isles, but is only a shell, lacking its furnace, airways and lehrs. Built by William Fenney who was the glassmaker at Bolsterstone and married the owner's daughter but displeased his mother-in-law. Her will required that he should not make glass within ten miles and Catcliffe met this condition. The works had two cones and worked until 1884, reopening briefly around 1901.

C23 BEATSON CLARK LTD

Greasbrough Road, Masbrough, Rotherham MB
SK 425934



Established 1751 by John Wright & Partners, bought by John Beatson 1783. Close and Clark families also involved from 1793; name of firm

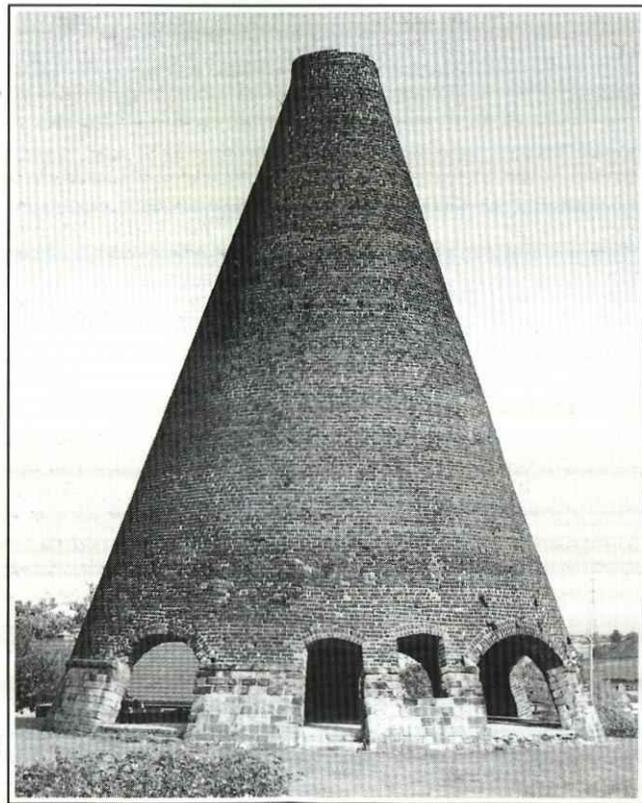
changed several times. Jars and other containers were the main products. Last glass cone demolished 1945. Now large modern glassworks.

C24 HOPE LARGEWORKS

Stairfoot, Barnsley MB
SE 375053



Founded by Ben Rylands 1867. His son Dan was responsible for many technical improvements including an early semi-automatic bottle-making machine (1885). In the late 1880s he held 94 patents. By 1874 they also made the Codd mineral water bottle, invented 1870 by Hiram Codd. It was closed by the pressure of the gas on a glass marble in its neck. The Rylands were in partnership with Codd 1877-84 and the works later became the largest maker of his bottle. The firm met financial problems and closed 1928. The site was bought 1929 by Beatson Clark whose works is still in production.



BUILDING MATERIALS

C25 HAVELOCK BRIDGE WORKS

515 Queens Road, Sheffield
SK 354885



Hodkin & Jones established 1868 (cf plaster sign on gable, now covered up), here c1900, fibrous plaster and artificial stone manufacturers. Terrace of houses is built from their artificial stone blocks.

C26 ST JOHN AND ST MARY MAGDALENE CHURCH

Goldthorpe, Barnsley MB
SE 464046



Reinforced concrete construction, radical for church at the time. Architect A Y Nutt. Consecrated 1916. Large tower with clock and four lancets. Nave alternates pilasters of smoother concrete and rougher walls.

A belt of Coal Measures ironstone runs roughly NNW-SSE across South Yorkshire from near High Hoyland to Kimberworth. The low grade ore consists of layers of nodules in clay and shale. The most important seams are the Tankersley, with three or more courses varying from two to eight feet thick or more, and the Swallow Wood. Local ironstone was mined and smelted in prehistoric and Roman times, by the Anglo-Saxons and from the 12thC to c1880. A few large sites continued iron smelting using ore from outside the area, and the last was Park Gate Works, Rotherham, where it ended in 1976.

IRON MINING

Bell pits were used to mine the ore, though there were a few larger mines. Many areas of bell pits have been cleared for agriculture, building or opencast coalmining, but some survive along the whole length of the seams, and a recent survey found well over 1000. Most are in woodland planted on the worked ground (Plantations). Some of the largest groups, eg in Hood Hill Plantation, have no public access, but others can be seen from roads or footpaths.

D1 TANKERSLEY PARK GOLF COURSE

Tankersley, Barnsley MB
SK 3598



Rows of large shaft-mounds can be seen from the footpath over the course and from the northbound M1. Mid 19thC, served by a branch of the Elsecar Tramroad to Milton and Elsecar iron works.

Other accessible groups at -

D2 Bray Plantation Kimberworth, Rotherham
SK 393944



D3 Parkin Wood Chapeltown, Sheffield
SK 3597



D4 Thornclyffe Lane Chapeltown, Sheffield
SK 346973



A dozen or so eroded shaft-mounds, on a hillside threatened with development, overlook the Newton Chambers site (D16) where the ore was used.

D5 Bell Ground Tankersley, Barnsley MB
SK 362992



Small group c1840-50 visible from A6135.

D6 Broomroyd Wood Stainborough, Barnsley ❖
Either side of footpath which enters wood at SE

328021 and passes over tramroad tunnel (M27).

D7 Hugsett Wood Higham, Barnsley MB
SE 306065



Mining lease 1607. Pits in SE of wood associated with Parker's blast furnace (c1800-06). Bridleway near NE edge of wood runs beside course of 1802 tramroad from furnace to Barnsley Canal near Barnby Basin.

D8 ROCKLEY ENGINE HOUSE

Rockley, Barnsley MB
SE 338021

SAM □

Tall Newcomen engine house of sandstone, datestone 1813 but possibly earlier. Drained an iron ore mine (probably also for coal) which is marked by earthworks in field to south. Engine said to have been moved to the Chapeltown area c1870 for further use. Engine house now owned by South Yorkshire Industrial History Society. Cutting to E is trackbed of Pillely Hills Colliery branch of Worsbrough Railway (c1832).

see photograph on back cover

MAKING IRON

In Roman and Medieval times iron was made by heating iron ore and charcoal together in a bloomery furnace, using natural draught on a hilltop or draught from a bellows. The iron did not melt but formed a small cake or bloom which still contained a lot of slag and was consolidated by hammering it to drive out the still liquid slag. Many bloomery sites are known in South Yorkshire, often by the remaining slag or 'cinder' (cf the common placename Cinderhill). In the late Middle Ages water power was used for the bellows and sometimes for hammers. An important site of this kind at Rockley Smithies (c1500-c1640), close to Rockley Furnace (D11), was excavated by David Crossley and Denis Ashurst but is now under the M1.

D9 KIRKSTEAD ABBEY GRANGE

Thorpe Hesley, Rotherham MB
SK 383950

LSII ❖

A charter of 1161 gave the Cistercian monks of Kirkstead Abbey, Lincolnshire, the right to dig iron ore around Kimberworth and build furnaces and forges. This building, restored in 1900, marks one

of their granges and includes medieval features. Their other grange was

D10 Thundercliffe Grange, off Grange Lane,
Rotherham MB SK 378938

■ 19

Rotherham Archaeological Society has excavated the older site opposite the 1771 house. In the medieval foundations are remains of a hearth, iron



D11: Rockley Furnace

Photo: David Crossley

slag and grindstone fragments suggesting some form of metal working. The monks' bloomeries, though, would almost certainly have been in the open, not among buildings.

The blast furnace, which came to Britain in 1496, used a stronger draught and a tall furnace stack to give higher temperatures. Ore and charcoal, and from the 17thC lime as a flux, were charged at the top. The slag was run off and the molten iron was tapped at the bottom into sand beds to make 'pigs' of cast iron. The Earl of Shrewsbury built a furnace at Wadsley and one at Kimberworth by 1583, probably the first in South Yorkshire. Others included Barnby near Cawthorne, Chapel (Chapel-town), Holmes (see D14) and the two survivors -

D11 ROCKLEY FURNACE

Rockley, Barnsley MB
SE 338022

SAM □

Built between 1698 and 1704, not 1652 as previously thought. Worked until c1741 and formed part of the iron trade 'syndicate' in South and West Yorkshire and beyond, centred on the Spencers of Cannon Hall, Cawthorne. Used again, possibly c1790, with coke fuel, to make gun castings. Stack with an inner lining of small heat-resisting sandstone blocks, but the hearth and most of the dressed stone from the outer faces have gone. To

the south is the charging bank which was linked to the furnace top by a bridge. A bellows powered by a water wheel would have made the draught. Now owned by the South Yorkshire Industrial History Society.

D12 LOW MILL FURNACE

Silkstone, Barnsley MB
SE 297067

SAM ❖

Apparently an 18thC charcoal furnace rebuilt to use coke. No documentary evidence has yet been found about a charcoal phase. Coke fired by 1799, and Cockshutt & Co worked it in 1820-22. Well restored by the present owner. Brick furnace with its hearth and much of its dressed stone cladding; wheelpit behind. Unusually the later casting house still stands, built over the tail goit. On private land but can be seen from the bridleway that was the Silkstone Railway (M26).

Abraham Darby developed a method of smelting iron with coke at Coalbrookdale, Shropshire, in 1709, but it was only slowly adopted in many areas. It was first employed in South Yorkshire c1770 by the Walkers who developed a large iron business in and around Rotherham. They came from a family of nailmakers in Grenoside and set up a small foundry there in 1741; nothing is left of it but Cupola Lane (SK 330941) marks the site. In Rotherham they had two main sites, at Masbrough and

Holmes. They made iron castings, and were noted for cannon (1765 on) and iron bridges. Thomas Paine, author of *The Rights of Man*, who developed a wrought iron bridge design (1788-90), and Rowland Burdon, who built a famous iron bridge at Sunderland (1793-96), both came for help to the Walkers, who also made the first Southwark Bridge in London (1819). They closed their Rotherham business in 1820-23 and moved to Tipton in the Black Country, but successor firms played an important part in the Rotherham foundry and wrought iron trades in the 19thC.

D13 CUPOLA WORKS

off Masbrough Street, Masbrough, Rotherham MB
SK 425928 ❖

The Walkers set up an iron foundry here c1746. Most has gone but this stone building may be part of the foundry. Altered front, round headed windows on E side, brick on W side and at back. Much altered house on W side. Now W Collins, waste metal. Across Centenary Way is the former Masbrough Independent Chapel (SK 423928), founded by the Walkers in 1763 and rebuilt in 1780, with their mausoleum (LSII) and tombs in its graveyard. Their houses included Ferham House (c1775-80, SK 415927 LSII), and Clifton House (1783, SK 435926 LSII), now Rotherham Museum.

D14 HOLMES BLOWING ENGINE HOUSE

Holmes, Rotherham MB
SK 410924 ❖

The Walkers leased the Holmes estate, with coal and iron ore, from the Earl of Effingham in 1757. It included a charcoal furnace here and a rolling and slitting mill at SK 413924. They rebuilt the furnace (1758), added a new one (1767-68), and converted it to coke and built another charcoal one (1769-70). By 1779 two coke and one charcoal furnaces. Boulton & Watt beam engine installed 1782 for blowing in dry weather. They also made tinplate here. Parts of the Holmes Goit, which provided water power for blowing and for the mill, can be traced from rebuilt Jordan Weir (SK 403922) past the iron works site, and where it returns to the Don in Rotherham under a bridge in Don Street (SK 426926). Nothing else survives from the Walkers' period.

The adjacent length of the Don Navigation was built in 1835. In the 18thC the Walkers had a private canal from their Holmes works to the river Don. A stone arch on the S side of the Navigation at SK 414923 □ took the Navigation towpath over the Walkers' canal.

The Park Gate Iron Co Ltd (Iron and Steel after

1888) had blast furnaces 1854-1920 on or near the site of the Walkers' ones. The very derelict surviving buildings include a furnace blowing engine house with a large cast iron water tank dated 1874 on the roof. The firm's main site at Park Gate dated from 1823 and made iron plate for Brunel's 'Great Eastern' and the first rolled armour plate for the Navy. Unusually for the area it developed as an integrated iron and steel works. It was replaced by Aldwarke Steel Works, the blast furnaces closed in 1976; the site has been cleared and redeveloped.

D15 ELSECAR IRON WORKS

Elsecar, Barnsley MB
SE 386997

LSII (part) □

Opened 1795 by John & William Darwin & Co to make pig iron and castings. Second furnace 1800. Darwin's bankrupt 1827 and Earl Fitzwilliam took over the works. The Dawes brothers leased it 1849 and later built more furnaces. It closed in 1884 and the remaining buildings became part of the Elsecar Workshops (B2). The 'Large Wagon Shop', probably an 1850s rolling mill, has cast iron arcades along the sides, originally open, and a 70ft wrought iron roof span. The stone built Plating Shop is pre-1850, and the Iron Works entrance in Forge Lane, with cast iron arch, 1860s. The furnace remains, beyond the steam railway, are largely buried in concrete. The first part of Distillery Side was a tramroad leading to the charging bank.

D16 THORNCLIFFE IRON WORKS

Chapelton, Sheffield
SK 3497 and 3597 ❖

Thomas Chambers and George Newton of the Phoenix Foundry in Sheffield, with Henry Longden who later took it over, leased the site from Earl Fitzwilliam in 1793 and built an iron works almost on the ore seams. Two furnaces built, 1795 and 1796, with steam engine for blast. In 1802 Newton Chambers' foundry work came here from Sheffield. They engaged in coal and iron mining, coking, iron making, foundry work and engineering. They were early and important contractors and suppliers of plant to the gas industry and built many gasworks in Britain and Europe in the 19thC. They built one in Buenos Aires in 1888 and supplied coal to it until 1914. Coking led them into chemicals, eg 'Izal' (1893). Other products ranged from excavators and steelworks plant to military tanks, one of which is preserved on the site. Pig iron was made until 1942. The other activities were sold off in recent years, followed by the site in 1987. Much of it has been cleared and part is a business park. The Izal works on Station Road has been replaced by housing and the tank and excavator works on

Warren Lane has gone. Remains in the furnace area at SK 351974 were destroyed by landscaping but a fragment of the unusual conical Rotunda casting hall of c1810 survives there on private ground. Early (1820s?) stone office block with later additions at SK 349974; near it a building which includes parts of an early stone warehouse, and

NW a later three-storey stone block with cast iron windowsills. Its top floor was the base for the 'Thorncliffe Experiment', a pioneering apprenticeship scheme introduced by Sir Harold West in 1942. The 'White House' (Thorncliffe Hall), neo-Georgian HQ of 1925 at SK 350972, was designed by Adrian Gilbert Scott.

FOUNDRIES

Iron from the blast furnace was cast as 'pigs' for use at the same works or elsewhere, or as iron castings ranging (at the Walkers) from guns and bridge parts to flat-irons. A speciality of the South Yorkshire iron works was the production of stove grates, firegrates, fenders and kitchen ranges, often with elegant or, by the mid-19thC, elaborate decoration. A number of foundries in Sheffield and Rotherham, like the Phoenix Foundry which gave rise to Newton Chambers, specialised in these products.

D17 GREEN LANE WORKS

Green Lane, Sheffield
SK 350882

LSII ❖

Founded 1795. Henry Hoole worked with noted designers such as Alfred Stevens, and exhibited stoves at 1851 Great Exhibition and 1862 International Exhibition. In 1860 he was Mayor of Sheffield, and celebrated by building the triumphal arch entrance, with plaques of Industry and Art. Now HQ of the engineering firm W A Tyzack, which restored the arch and rebuilt much of the works in the early 1980s.

Other stovegrate foundries in the area are:

D18 Wharncliffe Works, Green Lane

SK 348882

LSII ❖

Messrs Steel & Garland

D19 Union Foundry, Furnace Hill

SK 352878

❖

Gibraltar Foundry of Appleby, Schofield & Co here by 1787. In 1851 Norton, Simmons & Co, brass founders and stove grate manufacturers, Union Foundry. The two top blocks may be pre-1851. Now Whitcroft Works of C F Fieldsend & Co Ltd. Phoenix Foundry (see D16) was further up the Hill but has gone.

D20 EFFINGHAM WORKS

Thames Street, Rotherham MB

SK 425933

❖

James Yates took over the Walkers' Rotherham foundry interests 1823 and became Yates Haywood & Co 1846. Works with long three-storey facade and impressive central gate tower, opened 1855 and closed 1970. Now multi-occupied.

Other Rotherham stovegrate foundries include

D21 Ferham Works

Midland Road, Masbrough

SK 414931

❖

1850s and later. Now Brecks Heating.

D22 Queen's Foundry, Whitelee Road, Swinton SK 464997 ❖ **LSII** Hattersley Brothers moved from Sheffield and took over White Lees foundry of George Shaw in 1869. Another impressive front block.

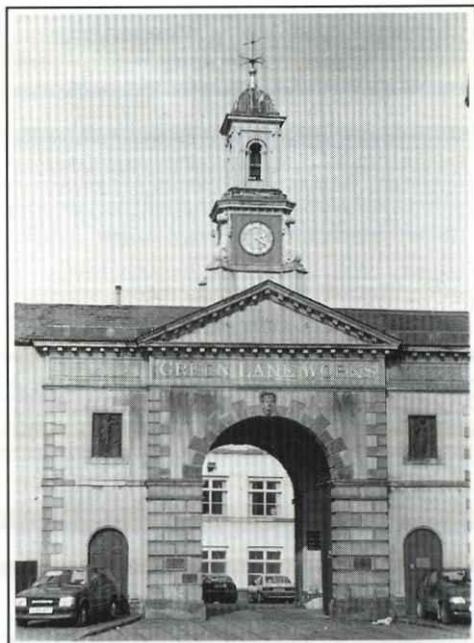
D23 BRIDGE FOUNDRY

401 Attercliffe Road, Attercliffe, Sheffield

SK 373884

❖

Thomas Clarke & Sons (Sheffield) Ltd, general iron foundry, here since 1865. Buildings refurbished and works modernised 1990.



D17: 1860 gateway of Green Lane Works, Sheffield

Photo: Ken Webster



D20: Front block and gateway of Effingham Works, Rotherham

Photo: Ken Webster

PLUMBERS' BRASSWARE

D24 GUEST & CHRIMES

Don Street, Rotherham MB
SK 427924

LSII ❖

Rotherham, and more recently Doncaster, are centres of the plumbers' brassware foundry trade. This stems from the invention of the modern high pressure screw-down tap by Edward Chrimes of Rotherham in 1845. The Chrimes brothers' brass foundry was expanded to exploit this and became

Guest & Chrimes 1847. They built this works from 1857 as a brass and iron foundry and are still here. Other products include hydrants, stopcocks, and valves and meters for gas and water supply.

D25 MILLMOOR BRASS WORKS

Masbrough Road, Masbrough, Rotherham MB
SK 420925

A dozen other firms entered the business. This was the works of William Heaton, brass and iron founder. Three ranges of brick workshops, with typical flues and chimneys, and louvered ventilator along roof.

WROUGHT IRON AND WATER POWER

A blast furnace produces cast iron, containing about 4% carbon. Many uses called for wrought iron, which is low in carbon and unlike cast iron can be shaped or forged under a hammer, rolled or drawn, and heat welded. Much of the iron from the early blast furnaces was converted to wrought iron by removing the carbon, at first in charcoal furnaces with an air draught (finery and chafery) and later in the coal-fired reverberatory or puddling furnace, invented by Henry Cort in 1784. The area, particularly Rotherham, had an important wrought iron trade in the 19th and early 20thCs. Products included sheet iron, armour plate and boiler plates, rails, wheels, axles and crankshafts. Steel has gradually taken the place of wrought iron for these uses and little now remains of the 19thC wrought iron works.

Before the use of steam power wrought iron was forged at water powered forges. The hammer was lifted by a cam wheel turned by the waterwheel and fell repeatedly on the workpiece. There was a series of heavy forges along the Don from Wortley to Conisbrough, and some on the larger tributaries. Lighter forges were used to make scythes (see H1). Some forges and rolling mills turned from iron to steel, and a few rolling mills used water power until the 1950s.

D26 WORTLEY TOP FORGE

Wortley, Barnsley MB
SK 294998

SAM LSI □

A unique water powered heavy forge, bought for preservation in 1953 and now open to the public (Z10). First known record 1623. In early 18thC a centre of iron working for the Spencer Syndicate. The Cockshutts had it 1739-1819; James Cockshutt was one of the first to adopt Cort's puddling furnace. Top Forge worked with Wortley Low Forge (SK 291995 ■), which made wrought iron in puddling furnaces and rolled it but where little now remains, and with D34-37. Top Forge made wrought iron railway axles by 1835, and until it closed 1908; Low Forge closed 1929. The forge

was directed 1871-1907 by Thomas Andrews II who did research into properties of wrought iron under extremes of temperature and had test rig in Top Forge yard. James Cockshutt and Andrews were both Fellows of the Royal Society. The Forge building has a 1713 datestone. There are two tilt hammers with their restored waterwheels, and a third wheel for draught to the furnaces; a replica of a blowing engine patented by James Cockshutt in 1771 is being built. The four cranes are original but the furnaces are not. Two cottages adjoin the forge, and the rebuilt foundry, blacksmiths' and joiners' shops stand at right angles. Works office now a private house.

D26: Inside Wortley Top Forge; No 1 hammer, centre and No 2 hammer, right

Photo:

Professor Francis Evans



D27 OUGHTIBRIDGE FORGE

Forge Lane, Oughtibridge, Sheffield
SK 308936

LSII ❖

Empty and neglected stone building of a water powered forge of 1792, rebuilt 1854, can be seen from A616 just north of village. There was one wheel and hammer, and a blower wheel.

D28 STORRS BRIDGE WHEEL

Storrs Bridge Lane, off Loxley Rd, Loxley, Sheffield
SK 291902

❖

Grinding wheel 1720, also a tilt by 1794. Rolling mill added by 1834, rebuilt after 1864 Flood and worked to 1956. Buildings gone but upper dam (post 1870), watercourses and wheelpit survive. Stone inscribed **Mark Below Two Feet Above Weir-As Agreed 1825** recalls a dispute about water levels with next works down, Loxley Old Wheel (SK 285898 ❖), where dam survives.

D29 WISEWOOD FORGE

off Loxley Road, Malin Bridge, Sheffield
SK 320895

(from footpath) ❖

Grinding wheel from 16th or 17thC. Tilt, forge and rolling mill by 1845, rebuilt after 1864 Flood. John Wood, latterly Richard W Carr, closed 1991. There were two wheels side by side, working hammers or rolls in buildings either side. Weir, dam, overflow, wheelpit and derelict buildings remain.

D30 MOUSEHOLE FORGE

Sheaf Street, Sheffield
SK 325891

SAM ■

Lead smelter, then iron forge, in 17thC. Making wrought iron from pig in 1717. Cockshutts were tenants 1740s-90s. Noted for anvils (M & H Armitage from 1827, trademark a mouse+HOLE). Rebuilt in early 19thC with four wheels - two for forge hammers, one for blowing and one for grinding.

Closed 1933, largely demolished in war. Present owners have restored house, hand forge and warehouse and conserved wheelpits, remains of hammers, watercourses and other features.

D31 PONDS FORGE

Sheaf Street, Sheffield
SK 358874

❖

Water powered forge on River Sheaf by 1736, expanded 1770s, steam engine by 1805. Marsh Bros took over 1852. Water power ended 1870 when Midland station built. Rebuilt by George Senior 1872, closed 1968 and demolished 1988, site now Ponds Forge international swimming baths and sports centre. Gateway c1900 rebuilt in Pond Hill, 80t steam-hammer anvil block stands by Sheaf Street.

D32 KILNHURST FORGE

Kilnhurst, Rotherham MB
SK 467975

❖

Spencers had forge in 17thC, next to lowest on the Don. John Smeaton installed six low breast wheels 1765 to drive tilt hammers and one for a slitting mill cutting wrought iron bar into rods. Cockshutts



D28: A reminder of past disputes at Storrs Bridge Wheel, Loxley
Photo: Simon Robinson

making wrought iron with the new puddling furnace c1790. Closed 1883. Little is left but remains of the weir upstream from Kilnhurst Bridge. Iron wire drawing was practised in Barnsley from 17th to 19thC. Much of the wire was used to make wool cards. Water power is claimed to have been used from 1624 in Thurgoland, Barnsley MB.

Four sites on the Don; all but first linked with the Wortley forges in 18thC. Latterly steel wire was made for needles etc. In order downstream -

D33 Oxspring Wire Mill SE 263028 ■

Modern wire works of Winterbottom (Wiredrawers) Ltd, making needle wire and similar products on old site.

D34 Old Wire Mill Thurgoland SE 278006 ❖

Claimed to date from 1624. Rebuilt c1850, Jagger family made needle wire to 1926. Buildings now a house, with dummy waterwheel.

D35 New Wire Mill Thurgoland SK 285998 ❖
c1727, run by Wordsworths 1840s-1974, closed

1979 and largely rebuilt as house.

D36 Tilt Mill Thurgoland SK 288999 ❖

In 19thC the Dysons made wire for Redditch needle and fish-hook trade, and fine wire for watch hair-springs. Had two undershot wheels and steam engine. Rebuilt as house.

D37 WORTLEY TIN MILL

Wortley, Barnsley MB

SK 294989 ❖

Built in 1743 John Cockshutt in connection with Wortley forges. Probably on site of earlier slitting mill. Rolled wrought iron into plates and coated with tin to make tinplate until early 19thC, then rolled plates for shovel trade. Closed c1870. Buildings gone. Unusual stepped weir (SK 296989), dam turned into fishing ponds, watercourses, masonry, sites of two waterwheels. Possibly the oldest British tinplate site with significant remains of original works.

NAILMAKING

From medieval times until well into 19thC nailmaking by hand on domestic forges was an important trade over a wide area from Grenoside and Ecclesfield (where it overlapped with cutlery and edge tools) northwards. For most of the period local iron was used. Few of the forges survive.

D38 NAIL FORGE

355 Barnsley Road, Hoylandswaine, Barnsley MB
SE 265047 LSII ❖

Row of three nailshops, one complete with hearth and bellows.

D39 JOSEPH CHARLESWORTH & SONS

behind 129 Spark Lane, Mapplewell, Barnsley MB
SE 265047 ■

In 1841 53 out of 73 households in Mapplewell were headed by a nailmaker. By 1860s competition from machine-cut nails made elsewhere led some of the small firms to turn to new products, notably chaplets and studs for the foundry trade. Charlesworths, the last of these, carried on until 1960s. Buildings derelict but include posts of an 'Oliver' hammer and base of a bevelling tool.

BLACKSMITHS

In the 19thC every village had a smithy, to shoe horses and make and repair tools and other metal goods, and they were common in towns. Many village smithies have survived in one form or another, and only a few can be mentioned.

D40 MALIN BRIDGE SMITHY

Holme Ln/Stannington Rd, Malin Bridge, Sheffield
SK 325894 ❖

Yard and buildings of a town smithy, now a rarity. Examples of village smithies:

D41 Sandygate, Wath on Dearne, Rotherham
SE 436006 ❖

Stone building, now making decorative ironwork.

D42 High Street, Carcroft, Doncaster MB
SE 544099 ❖

Brick and rubble with pantile roof, derelict, remains of lineshafting. Latterly D B Booth & Sons, agricultural and general engineers, gas, electric and alloy welding.

D43 Sheffield Road Hackenthorpe, Sheffield
SK 418832 ❖

Once used for shoeing pit ponies from Dent Main Colliery.

D44 Drabble's Yard High Street, Mosborough,
Sheffield

SK 427808 ❖

Now Moss House Computer Group. Two storey stone farrier's shop with pantile roof in NW corner of site, part of buildings of Drabbles Builders until conversion to offices in mid-1970s.

D45 Midhopestones Smithy, Midhopestones, Sheffield, SK 238993 LSII ❖ 25

Stone building by the unsuccessful turnpike Mortimer Road.

Steel is an alloy of iron and less than 2% carbon. Other elements may be added to give it particular properties. It is harder than wrought iron and holds a cutting edge. Steelmaking came to Sheffield because of the cutlery industry, and Sheffield became Britain's leading steel centre because Huntsman exploited his invention of crucible steelmaking there.

Steel was a costly product made in small amounts until the invention of the Bessemer Converter in 1855 made cheaper bulk steel possible. Bessemer set up in business in Sheffield which became the first centre of the bulk steel industry. Sheffield developed a high degree of skill in shaping steel for heavy engineering, shipbuilding, armour plate and heavy guns. Crucible steelmaking continued because the control it gave over composition and quality was essential in making tool and other special steels. Sheffield, Rotherham and Stocksbridge still make engineering and tool steels, using the latest electric melting technology, largely because of the area's longstanding expertise in making and working steel.

Since the early 20thC some steel works buildings have been of brick or concrete fill in a steel frame, and many of cladding on a steel framework. These were simpler to build on the scale required, and gave a clear space for overhead cranes. The steel industry's surviving buildings give a very incomplete picture of its history. It has continually rebuilt on the same sites, and closed sites have usually been cleared. The most striking example is the replacement of Hadfields' East Hecla Works by the Meadowhall shopping centre (which has a statue of crucible steel workers, a trade never practised there).

THE CEMENTATION PROCESS

Steel was taking the place of iron for the better grades of cutlery in the 16thC. It was brought in from abroad and then from works around Newcastle, where it was made from iron bars in cementation furnaces, a German invention. The process was introduced to South Yorkshire by 1672 and Sheffield by 1716–Steelhouse Lane marks one early site. By the early 19thC over half the output went into crucible furnaces; most of the rest was used for knives or springs. There were over 200 cementation furnaces in 1860 but no new ones built after c1880, and the remaining ones went out of use in first half of 20thC. Almost all have now disappeared. A stone-built furnace of c1740 at Derwentcote, Co. Durham, is the only survivor elsewhere in Britain.

E1 FIRTHS IRON WHARF

Effingham Road, Sheffield

SK 370880

LSII ❖

Best seen from canal towpath. Imported wrought iron bars, mostly from Sweden, were used for the cementation process because of their low sulphur and phosphorus content. Firths unloaded and stored them at this canal wharf. c1860, two buildings, one with gable to canal.

E2 DONCASTERS CEMENTATION FURNACE

Doncaster Street, Sheffield

SK 348880

SAM ❖

The only complete cementation furnace in Sheffield, now in the Midland Bank's car park. Built 1848, one of five in the steelworks that Daniel Doncaster began 1831 in his father's orchard. A plaque records that it was the last to be used in Sheffield, Oct 1951-Jan 1952. Restored 1993. Rest of works demolished, mainly in 1950s when British Iron and Steel Research Association labs were built here. The furnace is bottle-shaped like a pottery kiln; some were conical. Two rectangular sand-



E1: Doncasters cementation furnace, Sheffield

Photo: Ken Webster

stone chests were packed with iron bars and charcoal and sealed with wheelswarf (metal and sandstone particles from cutlery grinding) 'like a piecrust'. A fire below heated them at up to 1000°C (below melting point) for 5- 12 days, and they cooled for several more. The iron absorbed carbon from the charcoal and was converted to blister steel – gas blowholes caused blisters on its surface. A pile of 9-12 bars forged together under a tilt hammer made shear steel, and forged again they became double shear steel, the top quality.

E3 BOWER SPRING FURNACE

Bower Spring, off Gibraltar Street, Sheffield
SK 353879

SAM ❖

Remains of two furnaces built c1828 in Thomas

Turton's Franklin Works. Passed to Moss & Gamble c1853, used to 1911. Survived inside works buildings and discovered in 1970s when works was demolished. Part of structure, chests, flues, show internal layout of one furnace; outline of the other.

E4 CROZZLE WALL

Brightside Lane, Sheffield
SK 373891

The wheelswarf covering the cementation chests was turned by the heat of the furnace into a dark rough substance called crozzle, often used for the tops of walls. This good example stands between the road and Sanderson's Goit, head goit of the water powered Attercliffe Forge (E42).

CRUCIBLE STEEL

Shear steel was good for some purposes but its composition was uneven. Melting would remedy this, but the high temperature needed (up to 1600°C) was a problem. It was solved by a Quaker clockmaker from Doncaster, Benjamin Huntsman (1704-76), who used clay crucibles (already used for brass and glass) and over several years developed an enclosed furnace with controlled draught. For the first time steel could be melted and cast as an ingot. He moved to Handsworth near Sheffield in 1742, generally accepted as the date of his invention, and began commercial production at Attercliffe c1751.

Crucible steel found many uses including edge tools, files, razors, cutlery, machine parts, machine knives and cutting tools, dies, rolls, engraving plates, wire and springs. In the 1840s Sheffield made some 90% of Britain's steel and 50% of the world's. There was a large export trade, notably to the USA until 1900 or later. The Riepe process for making larger castings by pouring several crucibles into a mould was brought from Germany to Sheffield by Vickers 1855 to make bells, gearwheels and railway crossings. Later up to 1000 crucibles were poured via a tundish for one ingot or casting - a triumph of skill and organisation. Production still expanded for a while after the introduction of cheaper steelmaking methods. New furnaces were built until World War 1, but their place was taken by the open hearth furnace, the electric arc furnace and the high



Pouring crucible steel into ingot mould at Cammells. A crucible is being lifted from the furnace, back left. From a postcard of the 1920s

Derek Bayliss Collection

frequency induction furnace. The last crucible steel melt was in 1972 at T W Pearson, Matilda Lane. Sheffield has all the known remains of crucible furnaces for steel in Britain except for traces at Dark Hill in the Forest of Dean.

E5 BRITANNIA INN

Workshop Road, Attercliffe, Sheffield
SK 381888

LSII ❖

By tradition Huntsman's home in his last years. Date 1772 on gable may be made of his steel. Site of his first works (c1751) was on E side of Leeds Road and the second (c1770-1899) S of Workshop Road beyond Britnall Street; nothing remains of either.

E6 HUNTSMAN MEMORIAL

Hill Top Chapel, Attercliffe Common, Sheffield
SK 382894

□

Family tombstone and simple modern monument in the burial ground. Other tombs of iron and steel families including Swallows and Sorbys.

E7 ABBEYDALE INDUSTRIAL HAMLET

Abbeydale Road South, Sheffield
SK 326820

SAM LSII* □

The preserved Abbeydale Works (see H1 and Z1) includes a five-hole crucible shop of c1829 where you can see what the process involved. Clay for the crucibles was trodden out with bare feet, to give even texture and avoid air pockets. Crucibles were made in moulds, dried on shelves and baked. They were put in the hot coal or coke burning furnace, which is below floor level, and filled with broken blister steel bars. Ashes fell through grates into cellar and draught was controlled from there. Huntsman's crucible held 13lb, but later they held up to 100lb. They were lifted white hot from the furnace and carried to the ingot mould where the teemer poured the steel without splashing its sides - a skilled job calling for great physical strength. The shop has typical single slope roof and 'crucible stack' with flue for each furnace. The stack's inner brickwork and header courses are of yellow fire-bricks; metal ties held it together as it expanded and contracted.

E8 WELL MEADOW

Well Meadow Street, off Upper Allen St, Sheffield
SK 347887

LSII ❖

Another 'industrial hamlet', but near the city centre and sadly neglected. On left at end of street are workmen's houses and behind them workshops and a crucible stack. On right a manager's house, works gate, workshop and crucible stack. In the yard (not visible) the six-hole crucible shop and cellar are intact but the furnace holes filled in; other workshops round the yard. This group c1852 for Samuel Peace, steel and files; the first group

slightly earlier, taken over by Peace. Steelmaking ended 1926.

E9 BALTIC WORKS

Efingham Road, Attercliffe, Sheffield
SK 373882

❖

Joseph Beardshaw & Son set up 1819 and built this works 1854 on. Crucible shop has one of its two stacks; now Crucible Garage, and can be seen from gate or Bacon Lane canal bridge. Fine gatehouse and office block; fireproof building on Bacon Lane. Memorial plaque near gate to Zeppelin raid on 26 Sept 1916; 36 bombs dropped, 29 deaths. Across Efingham Road another crucible shop, post 1903; see stack from Stoke Street.

E10 SANDERSONS DARNALL WORKS

Wilfrid Road, Darnall, Sheffield
SK 385884

SAM LSII* ❖

Row of small crucible shops with seven stacks leads up to only surviving large crucible shop of late 19thC. By c1830 Sandersons were one of the largest steel firms, with works in West Street and Attercliffe (E42). They built a third works here from 1835 and, as Sanderson Bros & Newbould, rebuilt it 1871-2 with 180 crucible holes, to increase capacity and replace West Street works. These buildings date from then. Closed 1934, reopened in the War and possibly after. Large shop in poor condition; there are plans to refurbish it for new uses. It had 48 holes, in four groups of 12, with freestanding brick flues. Fine queen-post timber roof, wooden crane. Its crucible stacks cut down to the roofline. Offices and gate lodges, c1871, **LSII**. Kayser Ellison set up steelworks on adjoining site in Darnall Road 1912 (**SK 385886**), merged with Sandersons 1960 as Sanderson Kayser; the two sites were combined. The works continues to make steel, and includes two steel framed buildings of



E10: 1871-2 Large Crucible Shop at Sandersons Darnall Works, Sheffield
Photo: Derek Bayliss

c1917 with concrete and glass (LSII).

E11 HUNTSMAN WORKS

Coleridge Road, Attercliffe
SK 387891

LSII ❖

1899 for Huntsman's firm when it left Worksop Road. There was a 24-hole crucible shop: half survives, with impressive stack.

E12 LION WORKS

Mowbray Street, Sheffield
SK 350884

❖

John Bedford, steel and edge tools, founded 1792, here (Bramall & Bedford) by 1860s, then John Bedford & Sons. In 1915 they offered over 10,000 varieties of engineers' files. Taken over by Spear & Jackson 1972, closed 1984. 14 hole crucible shop and stack, post 1905, in Ball Street.

Remains of smaller crucible shops at -

E13 Malinda Street, Sheffield SK 348881 **LSII**

❖ Two rebuilt stacks, one shortened, with shop between.

E14 Cross Smithfield Street, Sheffield SK 349878 ❖ Remains of stack against vertical face at back of yard.

E15 Russell Works, Kelham Island, Sheffield SK 352883 ■ Shop and part of stack belong to Kelham Island Museum but not open to public.

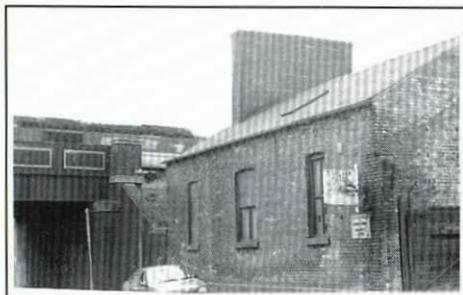
E16 Blonk Street, Sheffield SK 358877 ■ Small stack close to bridge.

E17 Mary Street Steel Works, Mary Street, Sheffield SK 354865 ■ Remains inside 1880s building.

E18 Britannia Works (T Inman), Furnival Road, Sheffield SK 362881 ❖ Small early 20thC works, crucible shop with stack at back.

E19 Clydesdale Works, 96 Effingham Road, Sheffield SK 367880 ❖ Small 1890s shop with shortened stack as part of wall in Canal Street.

E20 Pluto Works, Princess Street, Sheffield SK 371888 ❖ Crucible shop c1900 in East Coast Road with one complete and one shortened stack.



E20: Crucible shop of c1900 at Pluto works, Princess Street, Sheffield

Photo: Ken Webster

E21 TIP SHOPS

28 Stephen Lane, Grenoside, Sheffield
SK 329939

❖

House and surviving building of small crucible steelworks, pre 1851. Products included hand forged shuttle tips and springs for looms. No remains of crucible furnaces. Steel was made at Grenoside on a small scale in 18th-19thCs; furnace remains (no public access) on another site. Spindle Row, Top Side, cottages and workshop which made spindles from crucible steel.

E22 ROCKERY OF CRUCIBLES

11 Endcliffe Crescent, Sheffield
SK 330864 An unusual survival

❖

WIRE

E23 STOCKSBRIDGE WORKS

Stocksbridge, Sheffield
SK 2798 and 2698

❖

Crucible steel was used to make high quality steel wire for ropes and hawsers, piano wire, umbrella frames, crinolines, needles etc. Stocksbridge is unusual as a steel works which developed from a wire mill. Samuel Fox set up in former cotton mill at Stocks' Bridge on the Little Don in 1841, to make wire for hackle and gill pins for the wool trade, and then umbrella and crinoline wire. A wheelpit was found at north end of South Office Block during alterations in 1991. He patented (1852) the Paragon folding umbrella frame with **U** cross-section ribs, ancestor of all modern folding umbrellas. The works began to make crucible steel c1860, and was one of the first to use the Bessemer process 1862. It rolled rails from 1863 (but had no railway link until Fox built the Stocksbridge Railway 1877), and later made tyres, axles and springs. Open hearth furnaces 1899-1960s. Now part of British Steel Engineering Steels, with electric furnaces, continuous caster and rolling mills, making alloy, stainless and special steels. Stainless steel wire pioneered 1920; wire and narrow strip (eg strip for razor blades) still made here but by separate firms, Fox Wire and Avesta. Oldest buildings SK 273986: 1868 General Office, built of fireclay bricks; North Office Block, 1864 for fabricating umbrella frames; and South Office Block, 1877 for wire drawing. These two tall stone buildings are based on late 19thC textile mill design. The town of Stocksbridge was developed round, and for, the works.

E24 ECKLAND BRIDGE WORKS

Millhouse Green, Barnsley MB
SE 223032

■

Water powered paper mill 18thC-1860. Samuel Fox worked as wire drawing mill 1866-76. William



E25: Preparing steel measuring tapes for etching (1989) in A Tapes Shop, Chestermans, Bow Works, Pomona Street, Sheffield

Photo: Simon Robinson

Hoyland, Fox's works secretary, invented Flexus umbrella frame with spring steel ribs, set up here 1875. Now Hoyland Fox, still making umbrellas. Includes 19thC stone buildings round a courtyard.

E25 BOW WORKS

Pomona Street, Sheffield
SK 343862

James Chesterman (1792-1867) invented the spring rewind for window sashes, measuring tapes, etc, and set up in business 1821. He made 'metallic woven tapes' of linen with copper threads, and from 1842 riveted steel tapes. From 1853 on, working with Samuel Fox, he developed heat treatment of continuous steel strip (then made from wire) and thus the modern steel measuring tape. He moved here 1864 and the firm stayed until 1990, as Rabone Chesterman from 1962, making tapes, surveyors' land chains (links shaped on machine designed by James Chesterman in 1850s) and other measuring devices. Redeveloped as offices for Norwich Union, but street front (1891 on) and fronts of long narrow blocks for tapes either side of yard (1860s/70s) have been kept.

E26 COCKER WORKS

Effingham Road, Attercliffe, Sheffield
SK 375884

Marriott & Atkinson, steel, files and edge tools, on canalside site by 1837. Later Fitzalan Works of Cocker Bros, a leading wire firm dating back to 1752. Now Spring Division of Firth Rixson. Old building on R of street front, others facing canal.

See also Spartan Steel, Attercliffe Road (SK 377885 ❖), Jabez Shipman & Co's Attercliffe Steel Works 1860s-c1960 making crucible steel and many sorts of wire; crinoline wire still in 1902 and corset stays still in 1949. Matching fronts of 1880 to road and canal.

E27 GORDON WORKS

49-51 Valley Road, Meersbrook, Sheffield
SK 352846

1880s for William Wright, stay busks, umbrella ribs, crinoline wire and clock spring steel; here to c1930. In 1960s-70s umbrella works for Empire Rib Co.

E28 WOLF SAFETY LAMP

Saxon Road, Heeley, Sheffield

Built as crucible steel and wire works, 1880s-c1930. Safety lamp fuelled by spirit, not oil, which could be safely relit underground, invented by Wolf in Germany, made in Leeds 1880s, business bought 1913 by William Maurice and moved to Sheffield. Here by 1934, made miners' lamps until recently; now other industrial lighting.

E29 TINSLEY WIRE (TWIL)

Attercliffe Common, Tinsley, Sheffield
SK 392902

Site was William Cooke, Tinsley Steel, Iron and Wire Rope Works, c1900. Tinsley Wire (now TWIL) set up here 1933 as partnership of British Ropes, United Steel and Belgian wire firm Bekaert. Now mainly modern buildings, making agricultural and industrial wire and wire fencing.

THE 19th STEEL REVOLUTION

Some growing Sheffield steel firms moved from the town centre to new sites by the Sheffield and Rotherham Railway in the Don valley from 1845. This gave them space for new ventures such as making wrought iron and steel by puddling, making iron plate by forging and then by rolling, and making heavy guns. They included Cammells, Firths, John Brown and later Vickers, which all grew rapidly.

The converter invented 1855 by Henry Bessemer (1813-98) made bulk steel quickly and cheaply by blowing air through molten iron in a pear-shaped vessel. He had difficulties with unsuitable iron, but when these were solved he set up a works in Sheffield 1858 to develop, exploit and market his invention. He gave licences to John Brown (next door to him), Cammell, and Samuel Fox at Stocksbridge in 1860-62. At first railway rails were the main product. Siemens' reverberatory furnace, first used for glassmaking, was applied to steel as the open hearth furnace and produced better quality steel than Bessemer's process. Steel took the place of wrought iron for many uses including armour, ship and boiler plates and heavy guns. Sheffield became a leading centre of the armaments industry. The main firms made steel, rolled it, shaped it by forging with steam hammers and hydraulic presses, and used it in heavy engineering. Vickers, John Brown and Cammell acquired shipyards in 1897-1902, and became industrial empires.

Initially the Bessemer converter and the open hearth furnace could only use iron made from low phosphorus ores, eg from Cumbria and Spain. The 'basic' process invented by Sidney Gilchrist Thomas (1879) allowed the phosphoric ores of Cleveland, Lincolnshire and Northamptonshire to be used for steel. Much of the bulk steel trade moved to the orefields or to coastal areas, where iron and steel could be made on one site, and Sheffield came to concentrate on engineering steels and alloy steels. The Bessemer and open hearth processes are now extinct in Britain, and the last Bessemer converter to be used here, at Workington in 1974, is preserved outside Kelham Island Museum in Sheffield.

E30 CYCLOPS WORKS

Savile Street/Carlisle Street, Sheffield
SK 365885



In 1845 Cammells were the first Sheffield steel firm to move to a rail-linked site. It was in Savile Street and has been cleared. They expanded N of railway (now gone but marked by bridge in Sutherland Street), now Avesta's works for armour and related products. Older buildings mostly World War 1 or later but small part c1900. Tower in Carlisle Street houses substation on site of works generating station. Stone gateway near it from a pre-Cammells works, well above present works floor. Hydraulic power plant c1936, 3000t press c1903 by Henry Berry of Leeds, 8000t press of 1912 by Davy. Cammells had the world's first hydraulic forging press in 1863.

E31 STEELWORKS BUILDINGS

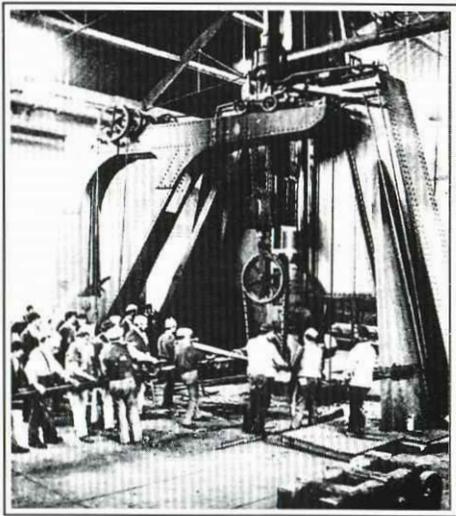
Savile Street East, Sheffield
SK 368887 to 371889



The block between Savile Street East, Carlisle Street East, Sutherland Street and Carwood Road was the growth point of the Sheffield steel industry c1850-65, with Thomas Firth, John Brown, Bessemer, and four other works either side of railway. Many buildings of that period survived until clearance in the 1980s. There remain:

Thos Firth & Sons Ltd Siemens Dept gateway, **LSII** built for open hearth shop, later part of Norfolk electric melting shop. Rebuilt a few yards from original site.

Part of John Brown offices, LSII built 1853 for short-lived Armitage Frankish & Barker, taken over by Brown 1856 as Atlas Works. John Brown (1816-96) set up own steel firm 1844, invented conical spring buffer for railways 1849. Here he made puddled iron for armour plate and boiler plate, and puddled steel. By 1859 he built up the site and extended beyond railway. Made Bessemer



Early steam hammer at John Brown's Atlas Works, from Theophilus Smith's *Sheffield Photographically Illustrated* (1865)

steel 1860, steel rails from 1861. Employed 200 in 1857, 4,000 in 1867.

President Works offices, built c1852 for Moses Eadon, later taken over by Browns. Nearly symmetrical facade with central gateway.

West Gun Works, LSII built 1863-4 as gun shop for Firths, had two 25t steam hammers with 160t cast iron anvil blocks. Recently refurbished for Grippe Ltd, making Hugh Facey's 1988 invention for joining strands of wire. Joint winner of Royal Institution of Chartered Surveyors annual award for commercial building conservation.

Atlas Works. Four gables of late 19thC shops for John Brown on SW side of Carwood Road beyond 'Brown's Bridge' over former railway.

E32 BESSEMER BUILDING

Carlisle Street East, Sheffield

SK 366887



1905 office block, architects Holmes & Watson (!), for firm founded by Bessemer, which was taken over by John Baker 1929 and became Baker Bessemer. The offices of Bessemer's 1858 works stood opposite until 1985.

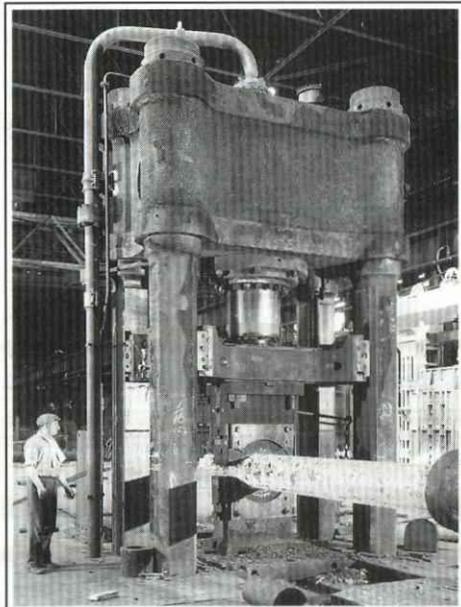
E33 RIVER DON WORKS

Brightside Lane, Sheffield

SK 3889 and 3890



Vickers moved here 1864 from the smaller Mill-



32

E33: No 1 hydraulic press, rebuilt but basically c1898 and still in use, at River Don Works

Douglas Oldham Collection

sands site in central Sheffield and built the world's largest crucible steelworks. Products included ships' propellers and propeller shafts; gun and steel armour plate manufacture began 1888. Electric power by 1897, North Gun Shop (gone) claimed to be world's first engineering workshop with all machines individually powered by electricity (1902). Now Sheffield Forgemasters, making high quality special steels, eg for aerospace uses, and very large castings and forgings. 1906 office block, architects Holmes & Watson, at SK 384903 **LSII**, marble and terrazzo interior, empty. Building to L **LSII** c1910 with cast iron lintels marked **VSM** for Vickers Son & Maxim or **V** for Vickers. Behind this an open hearth melting shop from Penistone (E35), now foundry. West of that the first Armour Machine Shop (c1890), now Pattern Shop. Medium Forge, facing railway, recorded 1871 as Hammer Shop; most brick walls removed but roof structure substantially intact, now used for storage. Works power station at SK386900. South Machine Shop (around SK 384901) 1897 and later, ¼-mile long. Four-gabled tower at SK 383897 is Gun Heat Treatment Plant, 1913 by Sir William Arrol.

E34 TEMPLEBOROUGH STEEL WORKS

Sheffield Road, Rotherham MB

SK 4091 and 4191



Bankrupt Phoenix Bessemer Steel Co of 1872 taken over by Steel, Tozer & Hampton 1875, Steel, Peech & Tozer (1883) and expanded rapidly. 1917 Templeborough Melting Shop built for 14 60-ton open hearth furnaces, on site of Roman fort where traces of ironworking were found. Rebuilt as largest electric arc melting shop in world with six 110-ton furnaces 1960-5. Closed 1994. Brinsworth Strip Mill, S of road, 1955-8.

E35 PENISTONE STEEL WORKS

Penistone, Barnsley MB

SE 2502 and 2503



Established 1862 N of railway by Benson Adamson & Garnett. Cammells took over 1864 and made Bessemer steel and rails, axles, tyres etc. Extended S of railway 1917 for gun forging with open hearth melting shop. Closed 1930, open hearth shop moved to River Don Works (E33) 1932, north side cleared, south side sold 1935 to David Brown as iron and steel foundry. Some 1917 buildings now house David Brown pump division.

ALLOY STEELS

E36 CLYDE WORKS

The Wicker, Sheffield

SK 358879



1853 offices of steel firm Shortridge & Howell, richly

decorated with elephants' heads etc, now Afro-Caribbean community centre SADACCA. Works taken over 1868 by Osborn as Clyde Steel Works and came to fill area between The Wicker and the Don. Had 185ft chimney featured in Joseph Pennell's famous engraving 'High Stack, Sheffield'. Works closed 1970, demolished early 1980s. Still one production building in Willey Street. Osborn began making files 1852, steel 1857, and took over and brought here 1872 the manufacture of Robert Mushet's invention of self-hardening tungsten tool steel (1868). Generally regarded as start of modern alloy steel industry, though crucible steelmakers had already tried out a variety of alloys – Sandersons produced alloys based on Michael Faraday's 1820s experiments.

E37 HECLA WORKS

Newhall Road, Attercliffe, Sheffield
SK 378891 ❖

Founded 1868, here 1872, for crucible steel castings. Robert Hadfield senior had been Attercliffe vestry clerk and then partner of Jabez Shipman (see E26). His son, later Sir Robert (1858-1940), born at Vestry Offices, Attercliffe Common (SK 382892 ❖); plaque. Began experiments 1877 in furnace in basement of family home, Ashdell Mount, Broomhill, and then here. Invented manganese steel 1882 (very tough, used for railway pointwork, crushing machinery etc), silicon steel 1884-86 for electrical transformers, and developed armour-piercing steel for shells. Built up major steel firm with wide product range here and at East Hecla Works, Tinsley (1897). By 1919 largest employer in Sheffield, 15,000 employees. Closed 1982 after series of takeovers. 1884 offices now South Yorkshire Trainers Group; some later production buildings behind.

E38 BROWN FIRTH RESEARCH LABORATORIES

Princess Street, Sheffield
S1K 369885 ❖

Now English Pewter Co, on corner of Blackmore Street. John Brown and Firths set up joint research labs 1908 in this purpose built block and put Harry Brearley (1871-1948) in charge. There had been earlier chromium steel alloys but the one discovered by Brearley 1913 during research on corrosion in gun barrels is the prototype of today's stainless steels. Plaque on building. Brearley came from a very poor family and educated himself while working in the labs, but had a dispute with Firths over the invention – all recorded in his lively autobiography *Knotted String*. The 18/8 chromium-nickel

stainless steel widely used today was developed here by his successor Dr William H Hatfield.

E39 STAYBRITE WORKS

Weedon Street, Tinsley, Sheffield
SK 390904 ❖

Built by Firths 1907 as Tinsley Works to make crucible steel for tools. Renamed Staybrite 1920s after their brand name for stainless steel, which was rolled here. Now Firth Vickers Special Steels Ltd and others. Crucible steel shop gone; original office on Weedon Street, power house set back from Meadowhall Drive.

E40 INSIGNIA WORKS

Rutland Road, Neepsend, Sheffield
SK 347885 ❖

1919-20 as spring shop in Osborns Rutland Works. Only known industrial building by architect W J Hale. Present name from prominent 'Hand and heart' trademark. Recently refurbished as workshops.

E41 PLUTO WORKS

Penistone Road, Wadsley Bridge, Sheffield
SK 334914 ❖

Carrs Special Steels Ltd, a smaller 20thC steelworks making tool steels. Richard W Carr, founded 1902, moved here from Princess Street (E20) c1920. On Fox Hill Road at SK 334915 ❖ Wadsley Bridge Steel Works formerly Moss & Gamble, now Hillfoot Steel Stockholders.

FORGING AND ROLLING

Water powered tilt hammers were supplemented by steam powered ones early in 19thC. With the advent of bulk steel greater power was provided for forging by Nasmyth's steam hammer, invented 1842 but first used in Sheffield 1855 at Sheaf Works, and the hydraulic forging press, first used at Cyclops Works (E30) 1863. Steam powered rolling mills made billet, bar and rod, plate and sheet, and sections such as railway rails. Many steel works had hammers, presses, drop stamps and rolling mills, but there were also specialist firms of forgers, rollers and stampers.

E42 SANDERSON KAYSER

Newhall Road, Attercliffe, Sheffield
SK 377892 ❖

Active steel works on site of water powered Attercliffe iron forge. Records from 1580s, associated with Fells in 17thC, Spencers and Swallows in 18thC when it forged steel as well as iron. Sandersons founded 1776, here 1822, rebuilt weir at SK 373889 (1825 datestone). Made steel in West Street and later Darnall Works (E10), forged and rolled it

and made products including files and bayonets here. Two beam engines supplied 1848; Nasmyth steam hammer c1860. Still six waterwheels 1895. Goit in water to Stevenson Road (SK 376892); E of road Sandersons' buildings outline former dam. Outlet to Don just above Newhall Road. 1870s offices, some late 19th and early 20thC buildings in works.

E43 CHANTREY WORKS

Bessemer Road, Attercliffe, Sheffield
SK 372887 ❖

Crankshaft forging works of Woodhouse & Rixson, set up 1881, now part of Firth Rixson. 1880s buildings empty; engine house facing river in East Coast Road.

E44 UNION FORGE

Savile Street, Sheffield
SK 361881 ❖

John Holding & Co (1955) Ltd, possibly the last Sheffield forge using steam to power hammers. Next door are remaining buildings of Hobson Houghton, Don Steel Works. Francis Hobson here by 1850 or earlier on site of former fulling mill, grinding wheel and corn mill; now Rotabroach Ltd. Good view from Effingham Street (SK 363881) across Walk Mill Weir on Don; gables lettered **HH**, head and tail goit arches, and possibly steam puffing from Holdings. (No longer; Holdings has closed since this was written.)

E45 BATH WORKS

Penistone Road, Sheffield
SK 346885 ❖

Burkinshaws founded 1868, here 1897. Small forge using compressed air 'steam' hammers in group of old rendered buildings. Two Lancashire boilers used as air receivers. Offices in part of former Philadelphia steam corn mill (1843 datestone); former penknife workshop hidden away. Contrasts with large 1943 Osborn Mushet tool works next door, now empty.

E46 STEAM HAMMER

Savile Street East/Sutherland Street, Sheffield
SK 367885 □

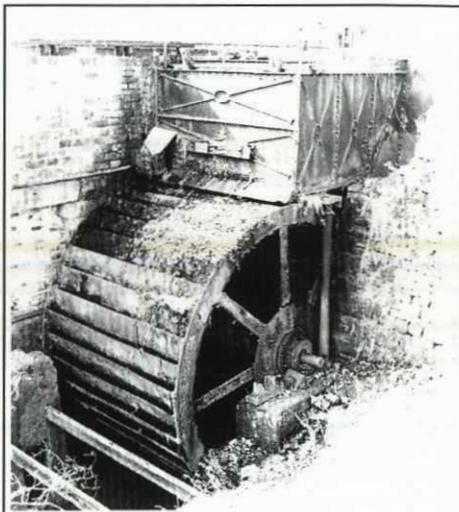
1947 Nasmyth type hammer by Brightside Foundry & Engineering Ltd, re-erected as monument on site of Cammells East Forge.

E47 LOW MATLOCK WHEEL

Loxley, Sheffield
SK 310894

LSII ❖

Cutters grinding wheel 1732 on River Loxley. Forge c1800. Rebuilt as rolling mill, datestone 1882. Water power used to 1956; wheel survives. Now



E47: The wheel at Low Matlock Photo: David Crossley

electrically powered, two sets of rolls. Barworth Flockton use it for special work. One of only three or four works in Sheffield still doing hand rolling - red hot bar is fed into the rolls, taken out and transferred by hand held tongs. Roll turning lathe, c1880?, still in use.

E48 RIVER DON ENGINE

Kelham Island Museum, Sheffield
SK 352883 □

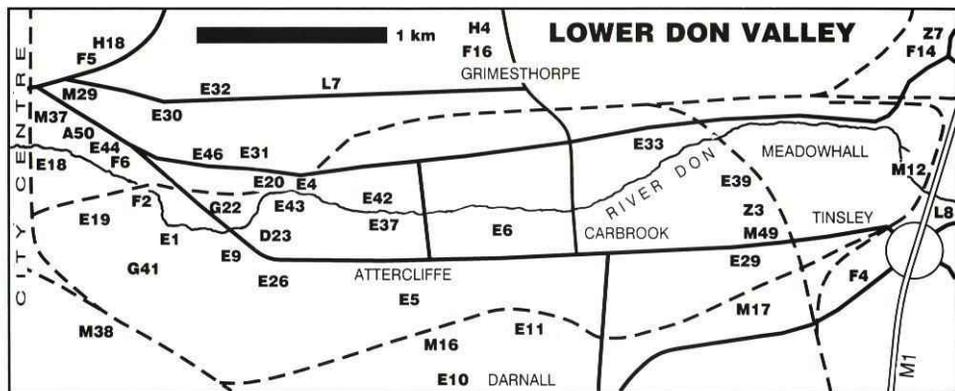
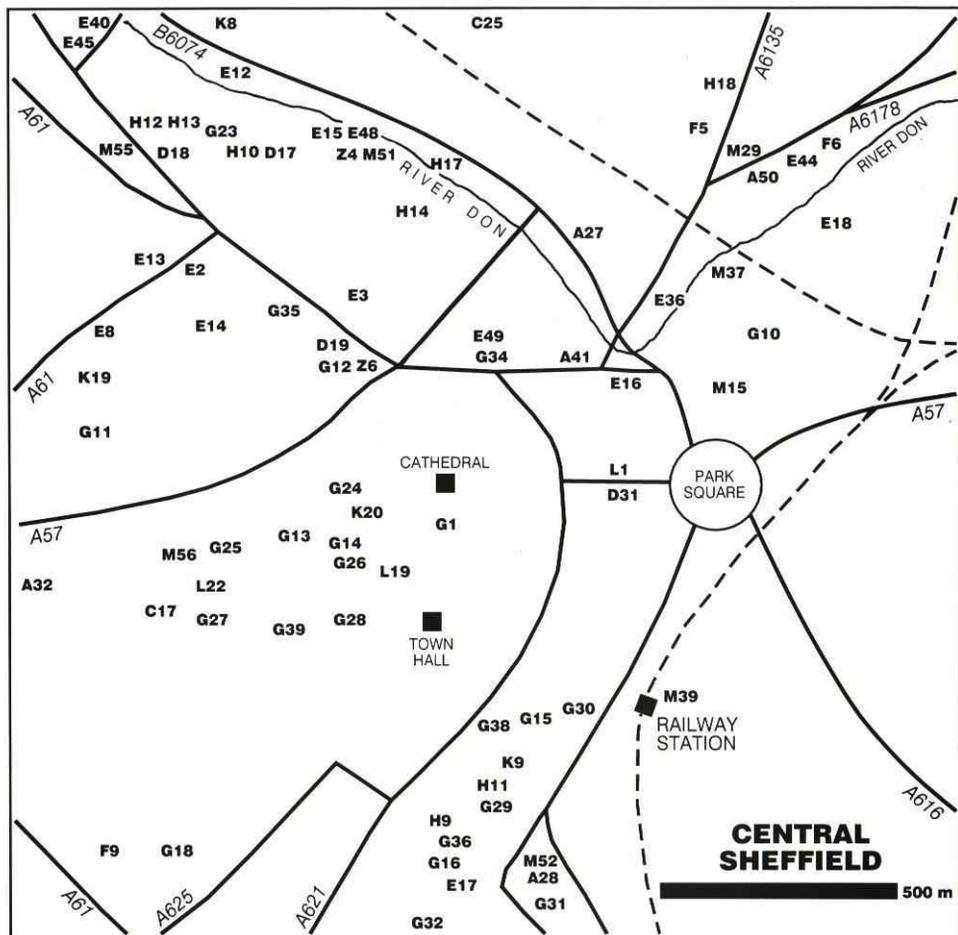
Very large 12,000hp 3-cylinder vertical steam engine built 1905 by Davy Bros, Sheffield, to drive armour plate rolling mill at Cammells Grimsthorpe Works. Moved 1950s to River Don Works and worked to 1978. Regularly run here. It could roll a 50-ton plate up to 16in thick, and could be reversed in seconds between two passes of the plate through the rolls.

MAGNETS

E49 ANCHOR WORKS

Love Street, Sheffield
SK 354878 ❖

Sheffield is a centre for making magnets because they were made of special steels (and many still are). H Shaw (Magnets) traces history back to 1783 and makes compass needles and small magnets for educational and industrial uses. Here since 1964, in former Love Street Steel Works of W T Flather.



SOUTH YORKSHIRE

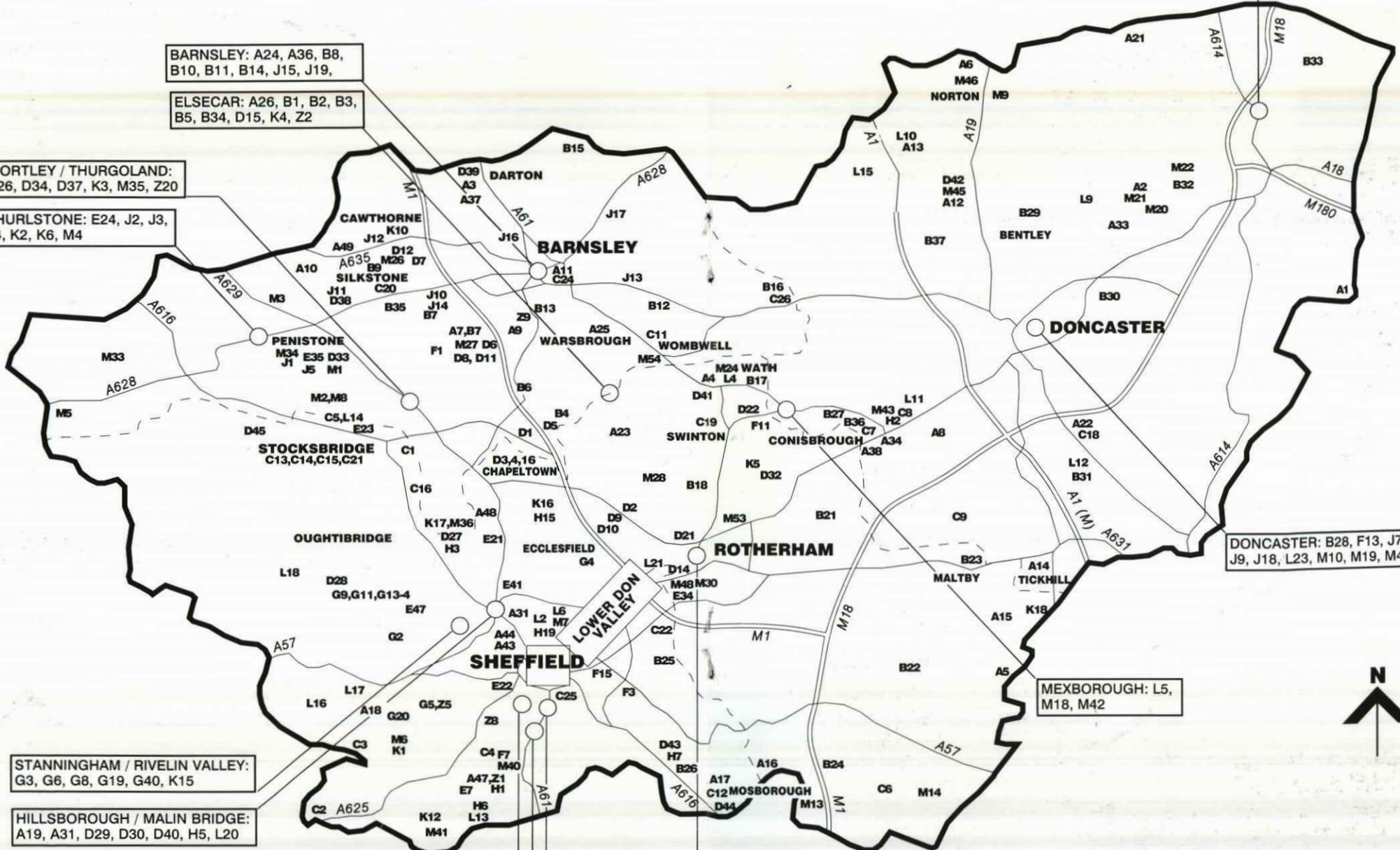
THORNE: A20, A29, A39, F10, F19, M23, M47

BARNSELY: A24, A36, B8, B10, B11, B14, J15, J19,

ELSECAR: A26, B1, B2, B3, B5, B34, D15, K4, Z2

WORTLEY / THURGOLAND: D26, D34, D37, K3, M35, Z20

THURLSTONE: E24, J2, J3, J4, K2, K6, M4



DONCASTER: B28, F13, J7, J8, J9, J18, L23, M10, M19, M44

MEXBOROUGH: L5, M18, M42

STANNINGHAM / RIVELIN VALLEY: G3, G6, G8, G19, G40, K15

HILLSBOROUGH / MALIN BRIDGE: A19, A31, D29, D30, D40, H5, L20

SHARROW / HIGHFIELD: A42, A45, A46, E25, G17, G33, G37

ROTHERHAM: A35, A40, B19, B20, C23, D13, D20, D24, D25, F8, F12, L3, M11, M31

MEERSBROOK: E27, H16, K8, K11

HEELEY: A30, C10, E28, F17, F18, H8, K21, M50



In South Yorkshire there is no clear division between engineering and steelmaking. Some steelworks made finished or semi-finished engineering products, eg for power plant or marine engineering, and many had large engineering workshops which could even make major items of plant. This section gives some examples of other engineering firms.

The first engineering firms began in the early 19thC to make steam engines, machinery for the coal, iron and steel industries, and parts for these. The Davy Group, now Davy International, came to dominate the making of heavy engineering plant such as steam engines and boilers, steam hammers, rolling mills and presses.

There were two major locomotive builders in South Yorkshire, the Great Northern Railway (GNR) and the Yorkshire Engine Co. Some steelworks rolled steel rails in the late 19thC, and railway and tramway trackwork, railway wheels, springs and other components were also made. There were several builders of railway wagons, mainly in Rotherham and Doncaster, and two major rolling stock builders, the GNR and Cravens.

The area is a large producer of steel and components for the motor industry, and the steel firms Vickers and Hadfield invested in West Midlands car firms (Wolseley and Bean respectively). Vickers' venture led to the development of the drop forging industry in Sheffield. But South Yorkshire has never had a major carmaker, though there have been several smaller ventures including the Sheffield Simplex which aimed to rival Rolls-Royce.

ENGINEERING

F1 STAINBOROUGH LANE FARM

Stainborough, Barnsley MB
SE 314020

Birthplace of Joseph Bramah (1749-1814), engineer and inventor, eg of a water closet, improved

A belt driven light engineering shop (J G Graves Ltd, c1925)
Photo: Sheffield City Libraries

locks, and hydraulic press. Trained Henry Maudslay and other leading mechanical engineers. Modern memorials in Silkstone Church (SE 291058; may be locked).

F2 PARK IRON WORKS

Leveson Street, Sheffield
SK 367882

Site of late 18thC ironworks. Still working 1837; coal



and iron brought from Tinsley Common in small wagons carried on canal barges. Booth & Co made steam pumping engines here by 1810 and into 1830s. Davy Bros founded 1830 and made castings, lathes, grinding and mortar mills, sawmills, and steam engines including a locomotive for Sheffield & Rotherham Railway. Moved here 1850-51 and made rolling mills, steam hammers, Bessemer converters and other steel plant, and sugar and textile machinery. Surviving steam engines in Sheffield at Abbeydale (1855, H1) and the River Don Engine (1905, E48). Early user of electric lighting 1881. Large forging presses made from 1885. Moved to Darnall over period 1921-53; this site to Cammells and now Tempered Spring who make anti-roll bars for cars. Buildings include large double-gabled late 19thC fabrication shop.

F3 DARNALL WORKS

Prince of Wales Road, Darnall, Sheffield

SK 395875

Davy's machine shops came here 1921, iron foundry 1924, other activities by stages to 1953. 38 acre site, now Davy International specialising in rolling mills, mill control systems, continuous casting machines and other equipment for steel, iron and non-ferrous industries. Other products include water treatment plant, and control system for Thames Barrage.

F4 EDGAR ALLEN ENGINEERING LTD

Shepcote Lane, Tinsley, Sheffield

SK 397905

William Edgar Allen began at Well Meadow (E8) 1867/8 making tool steel, files and circular saws. Began steel works at Tinsley 1890, pioneered Tropenas surface blown steel converter 1892, first electric furnace in Sheffield 1910, first tool steel making in induction furnace 1927. Railway and tramway points and crossings made from 1900, moved to this site 1919 and continues today; two main workshops and several others of 1919. Edgar Allen Tools Ltd make machine cutting tools in adjacent modern building.

F5 WICKER IRON WORKS

Spital Hill, Sheffield

SK 359882

The Walkers (cf Walker Street; not the Rotherham Walkers) set up here c1770. In 1892 Walker, Eaton & Co had iron and brass foundries, forge and machine shops and made steam engines and rolling mills. Taken over by Brightside Foundry Co, here until 1927. Site curtailed by railway viaduct but use made of its arches. Mid-19thC foundry building in yard; street front 20thC.

F6 ALBION WORKS

Savile Street, Sheffield

SK 363881

Thomas W Ward set up as coal merchant 1878 and expanded into scrap trade, industrial demolition, railway engineering and merchanting of machinery. Shipbreaking at Barrow in Furness and elsewhere from 1894. On part of this site from 1886, new head office 1902 and later. In 20thC a large industrial group in iron, steel, engineering, quarrying, cement, plant hire, etc, as well as dismantling and scrap. Closed 1983 but successor firms in plant, machinery and roadstone still here. Impressive office block with portico of polished granite from Ward's De Lank Quarries in Cornwall. Many of the workshops and showrooms behind have gone.

F7 VICTORIA WORKS

Archer Road, Millhouses, Sheffield

SK 341835

William Samuel Laycock (1842-1916), from family in upholstery business (K9), set up 1880 to make upholstery, window lifts and blinds for railways (not in directories until 1893). Later added automatic couplers and other railway components and was a pioneer of steam heating of carriages from engine. Began this works 1901, with own 300kw power station. Fitted out complete railway carriages, made aircraft engines and (1919-c1926) Charron Laycock cars. Became Laycock Engineering, specialising in universal joints, couplings and clutches for car industry, and from 1940s aircraft components. Recent demolition has left only the 1901 office block.

F8 MASBORO BOILER WORKS

Wortley Road, Masborough, Rotherham MB

SK 413932

Robert Jenkins, boilermaker, set up 1856 in workshops of abandoned North Greaves Colliery to make and repair boilers. From 1861 made forge welded boilers for kitchens and domestic heating, later other hot water boilers and vertical boilers for steam engines. Trademark 'Ivanhoe'. First company to establish electric arc welding as production process 1914. Transformer tanks, petrol tanks, cisterns made to 1970, now pressure vessel, pipe and heat exchanger fabrications. Oldest buildings in angle of Wortley Road and Wilton Gardens (1895 datestone).

F9 EDWARD PRYOR & SON LTD

Egerton Street, Sheffield

SK 347867

Cutlery and silverware firms put trade and other marks on their products with marks and stamps made by highly skilled mark makers; two or three

people still practise this craft. Edward Pryor took over a mark making firm 1849. His grandson engraved the Lord's Prayer on an 11mm diameter stamp in 1894; even smaller examples of this (7 and 10mm) are still used. In West Street area, moved to Broom Street 1928; buildings there (SK 344866 ❖) now Thos. Flinn, saw makers. First company to use three dimensional engraving machine 1936. Egerton Street works built 1960-c1980, includes back to back house and other older buildings. Now makes marking machines and equipment.

SHIPS AND BOATS

F10 DUNSTON'S SHIPYARD

Thorne, Doncaster MB
SE 684131 ❖

Richard Dunston Ltd here 1858-1985 building barges, tugs and support vessels; in World War 2 built 159 'Tid' class tugs and the largest batch (40) of Victualling Inshore Craft based on Scottish 'Puffers'. Built Britain's first push-tow tugs and compartment boats in 1960s. Sideways launches into canal; larger ships went as hull or in sections for completion at Haven Shipyard, Hessle. Cleared concrete yard. Slipways filled in, but dry dock gates can be seen from across canal.

F11 WADDINGTONS BOATYARD

Swinton, Rotherham MB
SK 464988 ❖

Working boatyard of main carrier on Sheffield & South Yorkshire Navigation, by modern lock named after him and remaining locks of the Dearne & Dove Canal.

F12 DISASTER MEMORIAL

Parish Church, Rotherham MB
SK 428928 (church may be locked) ❖

In church, marble plaque to 50 people drowned on

5 July 1841 when boat launched into Don at Providence Dock, Masborough, overturned.

RAILWAY VEHICLES

F13 DONCASTER LOCOMOTIVE WORKS ('The Plant')

Doncaster MB
SE 5703

LSII ❖

GNR set up locomotive repair works 1853. Expanded 1865 and built steam locomotives 1867-1957. Coaches built from 1866, and wagons until 1889 when Carr Wagon Works built (SE 585010 ■; parts survive in J I Case works). British Rail Engineering Ltd 1970, now mainly RFS Industries. 135 acre site. Early buildings designed by railway engineer Henry Carr include long office block opposite station (part originally turning shop) and part of machine shop behind (the first erecting shop). Loco erecting shop 1890; Crimpsall repair shop 1901.

F14 YORKSHIRE ENGINE CO

Meadowhall Works, Meadow Hall Road, Meadowhall, Sheffield
SK 391917 ❖

Steam locomotives built 1865-1956, diesels 1949-65, particularly for industrial work and export. Also a steam tram (1878), briefly cars (1907), colliery haulage engines etc. Long late 19thC brick shops, now ROM Ltd.

F15 CRAVENS

Staniforth Road, Darnall, Sheffield
SK 3887 ❖

Founded 1867, owned by John Brown from 1918 as outlet for tyres, axles and springs. Made wagons, coaches, multiple units, trams, trolleybuses, bus bodies and Lysander aircraft. Railway production ended 1960s, Craven Tasker made lorry trailers and containers to 1990. Now used for storage, oldest buildings at Sheffield end.



F13: 'The Plant', Doncaster. Note the wheels in the foreground

Photo: Ken Webster

ROAD VEHICLES

F16 DURHAM CHURCHILL

Chambers Lane, Grimesthorpe, Sheffield
SK 375901 ❖

Durham Churchill moved to former Grimesthorpe Grinding Wheel (no. H4) and built (1903) well lit brick three storey extension for car production. Hallamshire car made 1901-06, Durham Churchill charabancs and delivery vehicles to 1930s. 1949-90 used by Homeric Cutlery to make scissors. Now derelict after fire. Other surviving Sheffield car works include

F17 Finbat Works, Aizlewood Road, Heeley, Sheffield SK 349860 ❖ c500 Richardson light cars made 1919-21; one in Kelham Island Museum. Built

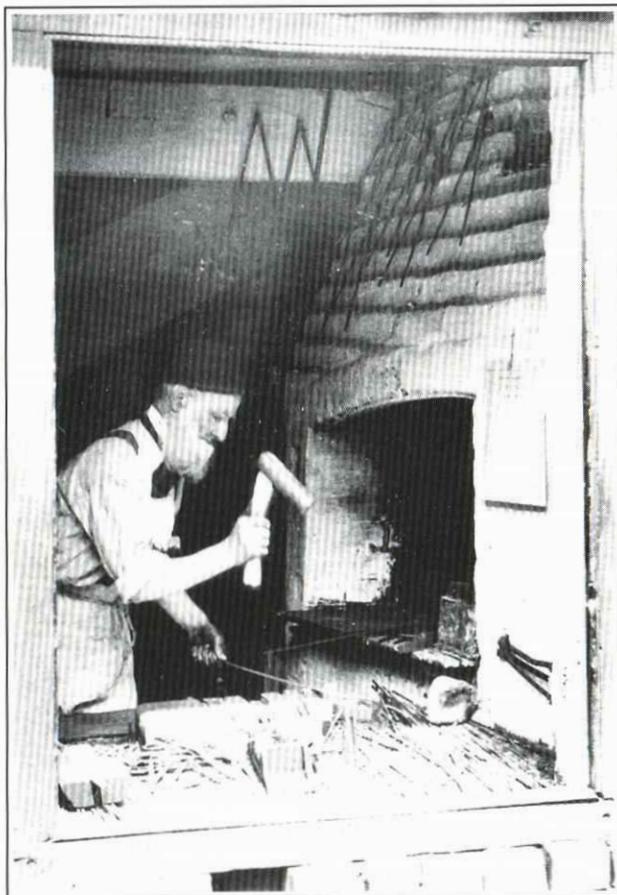
1870s as Hoffman brick kiln (C10), ground floor survives under modern corrugated superstructure.

F18 64-74 Broadfield Road, Heeley, Sheffield SK 350852 ❖ H F Goode designed innovative HFG cyclecar, made here 1919-21 by C Portass & Son, later Heeley Motor & Manufacturing Co. Coach built car and van bodies made to 1930. Two storey offices, altered single storey workshop.

F19 HIND'S WORKS

North Eastern Road, Thorne, Doncaster MB
SE 683138 ❖

Joe Hind built one car 1902 in former steam corn mill (A29). This works 1927, making Moss gearbox under licence for Ford vehicles including Model T. Offices survive, buildings behind replaced.



Old Henry Martin hand forging a file (1902)
See pages 49-52

Photo: Sheffield City Libraries

In Chaucer's *Canterbury Tales* (1386-9) the Miller is described as wearing a *Sheffield Thwitel* in his hose. The cutlery industry developed in and around Sheffield because of the plentiful supply of raw materials, notably iron ore and stone for the furnaces and grindstones and the abundant water power from Sheffield's five rivers, the Sheaf, Porter, Rivelin, Loxley and Don. The earliest reference to this in the metal trades is a lease of 1496 for a grinding wheel on the Sheaf, the later Mascar Wheel.

From the 16thC the industry was controlled by the manorial court of the Earls of Shrewsbury. Ordinances in 1565 and 1590 regulated the minimum time for apprenticeship and stopped any cutler hafting blades from outside Hallamshire. In 1624 the Cutlers Company was set up by Act of Parliament and assumed the role of the manorial court in regulating the trade in 'knives, sickles, scissors, shears and other cutlery wares' in the 'Lordship and Liberty of Hallamshire and six miles round'. (Hallamshire covered most of the area of the present city of Sheffield).

By the 18thC the industry had been divided into three main trades, *the forger*, who fashioned the blade, *the grinder*, who gave it its edge, and *the cutler*, who finished it and fitted it with a handle. Sheffield merchants began to sell the town's cutlery themselves in London and even on the Continent. Rising prosperity and growing markets meant that water power, now fully exploited, could no longer meet the needs of the trade. This led to the introduction of steam engines; Proctor and Belby of Sheffield enquired of Watt about a rotative engine as early as 1776, and the first steam wheel in Sheffield was erected in 1786. These steam wheels were primarily used for grinding, also served as workshops for cutlers and others. The regular working patterns which the steam grinding wheel brought increased the health problems of the grinders. Their average lifetime in 1865 was 30 years, because dust from the grindstones caused 'grinders asthma' or silicosis.

There was a complex pattern of subcontracting, in which the 'little mesters' might work on their own account or for merchants or larger manufacturers. Today the term is used loosely for any very small cutlery firm.

Mechanisation was a slow process; the number of different processes meant that it was cheaper to employ craftsmen than to invest in machinery.

The industry has contracted since World War 2, largely because of cheap imports from abroad. However cutlery and silverware still employ 2500 people in Sheffield, in both old and new works, largely making high quality, premium price products.

G1 CUTLERS' HALL

Sheffield
SK 354876

LSII* ❖

This is the third Cutlers' Hall on the site. It was built in 1832 to the design of Samuel Worth and Benjamin Broomhead Taylor, and was extended in 1867 and 1882 when the impressive banqueting halls were built. It is the headquarters of the Cutlers Company, formed in 1624 to regulate apprenticeship, production, quality and makers marks in the cutlery industry. The company lost many of its statutory functions in 1814 but still has the right to grant marks for metal goods to local firms. Today membership is also open to people in steel making, engineering and tool manufacture; unlike the London livery companies it does not admit other people. The Cutlers Company is now mainly concerned with promoting and representing Sheffield Industry. The name of Sheffield is registered in 23 countries and use of the mark 'Made in Sheffield' is controlled by the company. See also the section on Museums (page 69).

HAND FORGES

G2 SYKE

Dungworth, Sheffield
SK 288894

LSII ❖

A small stone farmstead occupied by farmer-cutlers from the late 18thC. There are five parts to the buildings: farmhouse, barn, smithy, cart house and pigsty. Two hearths in opposite corners of the smithy, each lit by three windows. The cutlers may have worked at a long range of windows now blocked by the cart shed.

G3 STANNINGTON

Sheffield.

There are several hand forges in the village.

Nook End Lane SK 309886 ❖

Small single storey workshop built of stone. The windows have been blocked up. Rented by five men; three worked on the street side and two on the garden side. They were outworkers for Wostenholmes who made double bladed 'Barlow' type knives for export to America.



G2: Farm and hand forge at Syke Bottom, Dungworth

Photo: David Crossley

Rock House Nethergate. SK 301882 ❖

The workshop is in the upper storey of a building in the farm complex. One large window, now blocked, through which the raw materials were hauled. Benny Wragg, spring knife cutter, and the Beal family making scissors. Also latterly used for scale pressing (see below, 'Handles and Scales').

G4 31 OAKS LANE

Shiregreen, Sheffield
SK 372923 ❖

A small single storey workshop with stone slated roof, now a garden shed. There were once three hearths.

WATER POWER

G5 SHEPHERD WHEEL

SK 318854

SAM LSII □

Access on foot from Oakbrook Road or Hangingwater Road. Water was harnessed to power grinding wheels along all five Sheffield rivers from the 16thC until the end of the 19thC and in some cases beyond. In Sheffield 'dam' refers to the reservoir as a whole, and 'goit' is the leat or race.

The earliest reference to Shepherd Wheel is in a will of William Beighton, cutter of Stumperlow, in 1584. By 1794 a Mr Shepherd rented the property, with 10 'troughs' (working places) and employed 10 grinders. From the 1820s it was owned by a family called Hinde through three generations until 1920. Building of local sandstone and roofed with stone slates. The large number of windows (originally unglazed) gave maximum light for the grinders. The

two grinding 'hulls' (workshops) are powered by a single overshot water wheel, 5.5m in diameter and 2m wide. Spokes, hubs and rims of cast iron, buckets of wrought iron with elm or oak backboards. Dam behind the building, weir a short way upstream. See also Z5.

G6 UPPER CUT WHEEL

Rivelin Valley Road, Sheffield
SK 312878 □

Built c1749 by Matthew and William Parker, and tenanted at least until 1921. Weir in poor state, head goit, wheel-pit and remains of buildings.

G7 HOLME HEAD WHEEL

off Rivelin Valley Road, Sheffield
SK 315881 □

The first record is a lease of 1742 to Nicholas Morton and William Shaw. Weir, overgrown dam, outline of buildings. Concrete floor near wheelpit with evidence of studs for machinery. Remains of pentrough and wheel. Tail-race culverted beneath a spur and for some distance separated from stream by edge-set slabs joined with wrought iron straps, to give greater fall at wheel.

G8 ROSCOE HEAD WHEEL

off Rivelin Valley Road, Sheffield
SK 317883 □

William Hoole rented a newly erected wheel here in 1725. It was abandoned by 1936. The weir is a shallow slope of dressed stone with three changes of gradient. Behind the top kerb is a second, formed of two arcs. Outline of buildings on either



G6: Postcard of Upper Cut Wheel, Rivelin Valley, in its working days

Derek Bayliss Collection

side of central wheel pit, with two storey north wall against hill side. Water passed through a stone arch to the breast shot wheel, now gone.

G9 OLIVE WHEEL

Loxley Valley, Sheffield
SK 304895

LSII ❖

Built 1714, part rebuilt as paper mill (K13). Weir, shuttle, stone-walled goit, dam in water. Two iron pentroughs over two deteriorating iron overshot wheels. The former grinding wheel is roofless; window apertures blocked, dumping hides the floor. A half buried gear wheel and two hearths remain.

Further upstream are the remains of Rowell Wheels, SK 299895 □, erected 1734. 1834 advertisement refers to 25 troughs for table knives and razors. Two masonry overflows, wheel pit and restored wooden pentrough.

WORKSHOPS

G10 SHEAF WORKS

Maltravers Street, Sheffield
SK 361877

LSII ❖

Built 1892-6 by William Greaves beside the new canal. He made cutlery and soon added steel and edge tools. Thomas Turton took Greaves over 1839 and added springs to products. Sold 1929 to Stephenson Blake who were here until mid-1980s. The main block is a pedimented stone building like a minor country house and is being refurbished as part of the Canal Basin development. Derelict outbuildings, remains of engine house by the railway viaduct. All the rest has gone on this side of canal, but the mid 19thC buildings across the canal, and beyond the railway in Lumley Street, now called Sipelia Works, (LSII), were also part of Sheaf Works.

G11 GARDEN STREET

Sheffield
SK 347876

❖

The cutlery industry expanded in this area as the town grew in the 18thC. It became tightly packed with workshops. The area has largely been rebuilt but a few good examples survive.

The characteristic top storey windows and ground floor hearths can be seen in the courtyard of nos. 52-56, (LSII). Stan Shaw, one of the last penknife cutlers, works here.

There are other early 19thC workshops, at nos 48 and 38, which have been used for a variety of trades connected with cutlery such as fork, scissors and shoe knife making and horn dealing.

At no 32 in a works of 1977 is the firm of Jones and Longbottom who have made butchers' and table steels since c 1900.

The former Sunday School across the road is used by William Whiteley & Sons for making scissors. At 216 Solly Street is James Lodge's Cambridge Works, (LSII), the front block is pre-1850.

G12 JOHN WATTS

Lambert Street, Sheffield
SK 352877

❖

The works is on the site of Courts 5-8, Lambert Street, and includes parts of mid-19thC houses and workshops as well as more recent buildings. The firm was founded in 1765 and has been here since 1872. It began by making clog clasps (its equipment is now at the Colne Valley Museum, Golcar, Huddersfield), progressed to cutlery, and was a pioneer of safety razors from the 1870s. Now its main product is industrial cutters and other lines include the 'Presto' egg opener.

G13 98-104 WEST STREET

Sheffield
SK 347873

LSII ❖

A late 1820s building, once known as Central

Works. Numerous cutlery firms and 'little mesters' have been here, most recently Morton's who made scissors until 1984 and had a cutlery shop which is now a few doors away. Only the listed front block was kept in 1992 and its promised restoration is still awaited.

G14 KENDAL WORKS

23 Carver Street, Sheffield
SK 352873

LSII ❖

Arranged around a courtyard, with the oldest part, c1830s, facing Carver Lane. It had been left untouched since the 1970s with the cutlers' benches and drive shafting, but is being converted to offices. Cutlery firms here included F Nowill & Co, J Turton & Co, and Rawson Bros.

G15 VENTURE WORKS

103-5 Arundel Street, Sheffield
SK 356869

LSII ❖

Until the early 1990s an active cutlery works, now offices. The front part appears to have been adapted from a town house, with outbuildings built as workshops on the Howard Lane side (four floors) and at the back (three floors). First used in 1820s by opticians, Firth Bros. In the mid 1860s J Sellers & Sons, 'Spring knife, razor, surgeon's instruments, engravers' tool and copper and steel plate mfrs' moved here followed by other occupiers. In 1901 Slater Bros, cutlery and electroplated goods, came here and stayed until recently. Similar buildings next door at 107-109 and 111-113, (**LSII**), Arundel Street, both used by the cutlery industry at least from the late 19thC but now in other uses.

G16 SYLVESTER WORKS

Sylvester Street, Sheffield
SK 354865

❖

Only the 1875 front block and a very derelict side block of c1840, (**LSII**), remain. The rest demolished in 1986. Water powered until mid-19thC but no signs left. Thomas Ellin & Co, merchants and steel and cutlery manufacturers, here by 1825. By 1933 Joseph Elliot was the main occupier; still here today (and at modern premises in Guernsey Road, Heeley).

G17 PORTLAND WORKS

Randall Street, Bramall Lane, Sheffield
SK 353861

❖

Built around the corner of the road. Impressive two storey gateway, topped by a cornice with 'Portland Works Est. 1859'. But first in directory 1879 when it was occupied by R F Mosley, cutlery mfr.

G18 EYE-WITNESS WORKS

Milton Street, Sheffield
SK 348867

LSII ❖

The front on Milton Street contains the general and private offices, showrooms, stock warehouses and packing and dispatch departments. It was built from early 1850s. At the rear are the workshops around a central courtyard. Today Taylors Eye Witness make Kitchen Devil knives here.

See also the **Beehive Works**, (**LSII**), of Gregory Fenton Ltd, further along Milton Street, another large courtyard works.

G19 ALPHA WORKS

Townend Street, Stanington, Sheffield
SK 301883

❖

A mid-19thC building of yellow brick, standing on stone footings, behind a house, Alpha House. It was the works of Lucas Oates & Co 'Spanish penknives, fancy knives, razors, beef can and sardine knives'. They were succeeded by Vickers and Dronfield 1903 and it closed 1932. It is the only cutlery workshop in the village that resembles a town workshop in type and size. Recently converted to a dwelling.

SILVERWARE

Old Sheffield Plate or fused plate was made by rolling a thin layer of silver on to the surface of a sheet of copper. It was used to make items such as tea and coffee services, trays, baskets and candlesticks for a wider market which could not afford sterling silver. Thomas Boulsover, a Sheffield cutler, began to make it for buttons in 1743. It was quickly used for a wider range of products but replaced c1840 by electroplating, developed by the Birmingham firm of Elkingtons who are now in Sheffield as a subsidiary of Parkin Silversmiths. Britannia metal, an improved form of pewter, is said to have been developed in Sheffield by James Vickers c1770, and was aimed at a similar market.

The largest 19th century cutlery firms such as James Dixon, Joseph Rodgers and Walker and Hall, were largely concerned with plated goods. There are still a number of firms producing high quality silver, plated goods and pewter.

G20 BOULSOVER MONUMENT

Whiteley Woods, Sheffield
SK 310851

LSII □

Thomas Boulsover, c1705-88, is said to have discovered fused plate while repairing a knife handle made of copper and silver which had overheated causing the metals to fuse. He produced it in the city centre in Norfolk Street, where the Crucible Theatre stage door now is. c1757 he



Grinding a knife blade

Sheffield City Libraries

moved to Whiteley Wood Hall and in 1760 acquired land on the Porter below it. Here he built workshops for rolling saw plates from steel and cottages to house his workers. Today the dam (Wire Mill Dam) and a cottages, **LSII**, remain. The memorial to him, based on a window from the works, was built in 1929. There is also a bronze head of him in Tudor Square in the city centre.

The Hall has gone but its stables survive (SK 307846 ■); it was later the home of Samuel Plimsoll of the Plimsoll line. A former Methodist chapel (SK 310846 ❖) was built by Boulsover's daughters in 1789 in his memory (plaque).

G21 ASSAY OFFICE

137 Portobello Street, Sheffield
SK 347878 ❖

Created by Act of Parliament in 1773, with the Birmingham Assay Office. The introduction of Old Sheffield Plate had been followed by a great increase in work in silver. It tests that articles of silver (and now gold and platinum) come up to prescribed standards. It is governed by 'The Guardians of the standard of wrought plate within the town of Sheffield' and managed by the Assay Master. The building is modern.

G22 THESSCO LTD

Windsor Street, Sheffield
SK 371884 ❖

Precious metals smelters, formerly the Sheffield Smelting Co Ltd. The firm at first recycled the waste and sweepings from the silver workshops. It was founded 1760 by John Read, moved here c1790, and passed to the Wilson family 1846. Completely rebuilt in modern times.

G23 CORNISH PLACE

Green Lane/Ball Street/Cornish Street, Sheffield
SK 351883 **LSII** ❖

The firm of James Dixon was founded 1806 and made cutlery, plated goods and Britannia metal goods. Cornish Place was started in 1822. This very large site eventually covered 4 acres and employed some 800 people. The Ball Street and river frontages are worth seeing as is the courtyard (off Cornish Street) if it is open. Most now empty and the future remains uncertain.

G24 ANGLIO WORKS

Trippet Lane, Sheffield
SK 352874 **LSII** ❖

Early 19thC. Used in the 1850s by Mary Chester and Son and later by Chester Bros, horn, ivory and tortoiseshell merchants and cutters. The silverware and cutlery firm of Walter Trickett was founded 1876 and was here until 1989. Now empty, derelict, and partly demolished by developers.

G25 HUTTON'S BUILDINGS

West Street/Orange Street, Sheffield
SK 348874 ❖

Built 1885 for William Hutton and Sons. They were established 1800 in Birmingham, Sheffield branch c1832. Electroplating licence, the second in Sheffield, 1843. Manufacturing ended 1930 and goodwill transferred to Dixons. Large group of buildings round courtyard, 3-4 storeys high. Shops along West Street; the buildings round the yard converted to offices and workshops 1990. The site was the West Street steel works of Sandersons (E10 and E42) until the early 1870s.

G26 ALPHA WORKS

Carver Street, Sheffield
SK 352873 ❖

Harrison Bros & Howson founded 1796, name dates from 1847. Works built c1898 (1900 dates-tone) when the firm was a leading one in silver and plated goods with over 700 employees. Four storeys, 39 narrow bays, side wing at N end. Elaborate door and gate with trademark over it. Now shops and offices.



A 'buffer girl' polishing silverware at Roberts & Belk, Sheffield (1975) *Sheffield City Libraries*

G27 ABERDEEN WORKS

Trafalgar Street, Sheffield
SK 349872 ❖

Front dated 1883, Francis Howard, silversmiths, have been here continuously since then. The yard behind, with an entrance from Division Street contains some older buildings c.1840s.

G28 LEAH'S YARD

Cambridge Street
SK 352872 ❖

Built early 1870s. Henry Leah, diestamper, came here 1892 and shared with other 'little mesters'. Taken over by Spear & Jackson 1976 and passed through several hands. The stamps (now gone) in S part of the W wing were still occasionally used in 1987, the last in the city centre.

G29 STERLING WORKS

74/76 Arundel Street, Sheffield
SK 355868 ❖

74 was occupied in the 19thC by Lockwood Bros, cutlery and edge tool mfrs. They left the site when they rebuilt their Spital Hill Works (H18) in the late 19thC. C W Fletcher were founded in the late 19thC as silver forgers and came here after World War I. Now they occupy the whole site but there are two

separate firms, C W Fletcher (Silversmiths) Ltd. with nine employees making silverware by traditional methods and C W Fletcher and Son Ltd., precision engineers, with c80 employees and customers including the aerospace industry.

G30 REAR OF HOWARD HOTEL

Surrey Lane, Sheffield
SK 357869 ❖

LSII (part) ❖

The buildings at the back and N side of the hotel have had various industrial uses. In 1876 they were the Britain Works of Jehoida A Rhodes, silversmith and electroplater. Also used as a brush works (1889).

G31 TRURO WORKS

Matilda Street, Sheffield
SK 357867 ❖

LSII ❖

Built from 1840s for Joseph Cutts, mfrs of silver plate and Britannia metal. A three/four storey group of buildings rounded on the corner of Matilda Street and Mortimer Street. Converted into student accommodation for Sheffield Hallam University.

G32 REGENCY HOUSE

St Mary's Road, Sheffield
SK 353864 ❖

W and G Sissons descended from a firm founded 1784 to make Old Sheffield Plate, which adopted electroplating in the 1840s. It moved here in 1880s. In 1915 it developed the first steel helmets for the army from the design of a lead miners' hat. Between the wars it began to make sinks out of monel metal (a nickel-copper alloy). It moved 1975 to Calver Mill, Derbyshire, built for cotton 1803-4, and now it is moving again.

Two doors away is the pewter firm I Gibson & Son Ltd in another old works. In Mary Street the backs of these works and the works (no. 104) of Warriss & Co, silversmiths, est. 1855, are all 1870s or 80s and worth a look.

G33 STAG WORKS

84 John Street, Sheffield
SK 352862 ❖

Large brick courtyard works, c1880, for Lee & Wigfull, silver and electroplated goods. It has now come down in the world and is multi-occupied. Next door are two small file and edge tool works of similar date. **Harland Works** and **Clifton Works**, with adjacent gateways and a shared yard.

G34 BRITANNIA WORKS

Love Street, Sheffield
SK 355878 ❖

The name reflects the main product of Broadhead and Atkin, 'manufacturers of Britannia Metal, British Plate, German silver, and silver plated goods; 47

electroplaters etc.' who moved here in 1845 and left in the 1880s. The building is late 1830s or early 1840s.

OTHER PRODUCTS

As well as knives, the cutlery trade made products such as steels for sharpening, scissors, open razors and razor blades, surgical instruments, cork-screws, manicure sets and nut picks.

G35 KUTRITE WORKS

Smithfield, Sheffield
SK 351877

❖
Founded 1902 by Ernest Wright, now part of Hiram Wild. Scissors and tools. The buildings in Smithfield date from 1962. See the older Snow Hill front and the board listing the firms Kutrite have taken over, with dates of foundation – in one case 1739. The Snow Hill site belonged to the file firm Hale Bros, founded 1842 and taken over by Kutrite 1969. Kutrite have just moved out.

G36 GRANTON WORKS

Arundel Street, Sheffield
SK 355868

❖
Ragg Tuning Forks, only British makers of tuning forks and last makers in 1977 of the open razor. Billy Hukin, the last open razor grinder, worked here in the 1970s. Also the Granton Knife Co and Granton Ragg Cutlery. The building is modern.

G37 WARDONIA WORKS

Countess Street, Sheffield
SK 354863

❖
The works is made up from houses on Countess Street with a pub on the corner and a small 19thC cutlery works (India Works) on Clough Road. Thomas W Ward and Sons Ltd. made, and later imported, safety razor blades and were merchants for a wide range of cutlery and other products. Ward had been Gillette's agent for Northern England and Scotland and were merchants for a wide range of cutlery and other products. They moved out in 1984 and are in Harthill, Notts. Now small workshops and offices.

HANDLES AND SCALES

Several materials were used for making the handles and scales of knives, including horn, buffalo,

ivory, pearl and bone and more recently plastic. Scales are the metal frame of a pocket knife which carries the blades and also the covering which is riveted onto the frame. The trade was one of small firms, largely in the area just W of the city centre. The same materials were used for other products such as buttons.

G38 PEARL WORKS

17-19 Eyre Lane, Sheffield
SK 355868

❖
The firm founded as Henry Porter in 1895 became William Gillott & Son by 1902. It moved here in 1925 and the building dates from around then. The pocket knife cutler Ernest Mills, who started work in 1915, worked in the basement from the 1950s until his retirement in 1985. The building is now empty.

G39 SELECT CUTLERY WORKS

188/190 Rockingham Street, Sheffield
SK 351872

❖
Only the front building of this small works remains. The gateway and the building to the L of it date from before 1851. W H Parkin, bone haft and scale cutter, has been here since the turn of the century, sharing with other firms, (26 in 1931).

G40 643 STANNINGTON ROAD

Stannington, Sheffield
SK 304887

❖
This two storey workshop belonged to James Vickers, razor scale presser, who died in 1870. The outshot at the back was probably used to house the vats for softening the bone and horn used in making the scales.

G41 BONE MILL

Effingham Road, Sheffield
SK 370880

❖
Brick built, four storey building with arched windows, best seen from Canal towpath. Samuel Meggitt (later & Son) here by 1865. Kelly's directory 1890 has the firm as 'bone and wood button manufacturers, glue makers, bone merchants and crushers and manufacturers of artificial manure', with other works at Denaby and Sutton-in-Ashfield, Notts.

The edge tool industry developed in Sheffield with the cutlery industry; at first there was little distinction. The invention of crucible steel in the 1740s helped to make Sheffield a leading centre for edge tool production. In the 19th C edge tools were made by most of the large steel firms and many edge tool firms large and small made their own crucible steel. Edge tools were exported round the world, particularly to America until it developed its own industry. Now only a handful of large firms and a few smaller ones are left.

AGRICULTURAL TOOLS

The Sheffield area was a major centre for the production of all types of agricultural hand tools - scythes, sickles, spades, shovels, hoes, forks, sheep shears, hooks etc. The sheep shear makers were mainly on the N side of Sheffield, the scythe trade on the S along the Sheaf, and sickles at Ridgway, Hackenthorpe, Troway, Ford, Eckington and Mosborough on the Derbyshire border (but there was one sickle works at Conisbrough.) One important example, the Phoenix Works at Ridgway, now converted to houses, is just over the border in Derbyshire (SK 402822). The main scythe firms also made components like mower blades for agricultural machinery.

H1 ABBEYDALE WORKS

Abbeydale Road South, Sheffield

SK 326820 *see photo inside back cover* **SAM LSII*** □

Now a site museum, Abbeydale Industrial Hamlet (Z1). On site of a possible 16thC lead smelting works and late 17thC cutlery grinding wheel. Abbeydale made scythes, grass hooks, hay and silage knives, peat cutters, river knives, etc. from c1714 till it closed in 1933 when Tyzack Sons and Turner concentrated on their Little London Works further down the Sheaf. It made its own crucible steel in an 1829 crucible shop (E7). Four water wheels powered tilt hammers, a blowing engine, horizontal boring machines, and a grinding hull (workshop). The Tilt Forge was built 1785, the Grinding Hull 1817. A Davy Bros (Sheffield) horizontal steam engine was added in 1855. Scythes are still ground on site, using traditional methods with the grinder held in a rope sling, though carborundum replaces the old sandstone, and electric motors give a constant speed for the stones.

H2 BURCROFT WORKS

Burcroft Hill, Conisbrough, Doncaster MB

SK 517922 ❖

John and Thomas Mullins, from the sickle-making area of the Ford Valley SE of Sheffield, came here by 1805. The works passed to the Booths by 1847. In 1861 the 37 sickle makers of Conisbrough were the largest occupational group after agriculture, but by 1871 they had been overtaken by glassmakers, coalminers, and domestic servants. In 1932 the works produced 180 patterns, each in 6 sizes, exporting them world-wide. Spear & Jackson took over George Booth & Son Ltd and the works closed in 1976. Brick and limestone buildings round a courtyard, mostly early 19thC, are all derelict. Plain

square brick chimney, row of forge chimneys along N wall. Owner's house at E side of site. N of the main buildings the limestone shell of the early 18thC Conisbrough Corn Mill - the sickle works greatly extended this in brick, but a fire in 1987 left only the original building.

H3 BRUNSWICK WORKS

Forge Lane, Oughtibridge, Sheffield

SK 309935 ❖

Two single storey brick wings, one with chimneys for hand forges. Built c1905 on site of Oughtibridge Corn Mill and Tilt, for Trade Unionists' Sheep Shear Co-operative Society Ltd, which was set up in Eldon Street, Sheffield, in 1894 by workers from Burgon & Ball after a dispute. Stayed in business until early 1960s when Burgon & Ball took it over.

H4 GRIMESTHORPE STEAM GRINDING WHEEL

Chambers Lane, Grimesthorpe, Sheffield

SK 375901 ❖

Stone-built two-storey works c1840. Remains of chimney and flue at back. Associated with William Wilkinson & Sons, sheep shear makers, founded 1730. They merged with Burgon & Ball 1898 and production moved to La Plata Works. In 1903 the building was taken over by Durham Churchill (F16). From 1949 to 1990 scissors makers Homeric Cutlery were here and rebuilt much of the interior. Now empty and derelict.

H5 LA PLATA WORKS

Holme Lane, Malin Bridge, Sheffield

SK 325895 ❖

On site of Turner Wheel, a 1690s cutlery grinding wheel; weir and watercourse remain. Burgon & Ball were founded 1866 to make sheep shears patented by James Ball and came here in 1873. Ball

left 1883. Now the only British maker of hand sheep shears, and home of Wool Shear Workers' Trade Union (founded 1890), the smallest union affiliated to the TUC, with only 13 members. Other products include scythes, bought from Tyzack Sons & Turner of Little London Works when they closed down 1988. Hand sheep shears are still used for a variety of purposes, including gardening, and trimming of blanket edges in Witney, Oxfordshire.

H6 PEAR TREE WORKS

School Lane/Annesley Road, Greenhill, Sheffield
SK 346813

A small two-storey workshop, possibly converted from farm buildings for filecutting or sickle forging. More recently Stuart Truelove made tea planters' pruning knives and quality hand made bowie knives here up to 1980s. Now empty.

H7 SEVERQUICK WORKS

Main Street, Hackenthorpe, Sheffield
SK 418832

Established 1743 by local landowners the Staniforths. They also had interests in water-powered grinding wheels (of which there are still traces) on the Shire Brook to the N. Buildings of local sandstone around a courtyard with a pond which probably provided water for a beam engine of 1820 by Peel and Williams of Manchester. This allowed grinding to be brought here. 19thC additions to the N include a large square chimney base. Owners' house 'Greenside' c1825 adjacent in Beighton Road. Thomas Staniforth & Co Ltd taken over by Spear & Jackson and closed c1980. Now multi-occupied and in poor repair. Abbeydale Industrial Hamlet (Z1) has Staniforth agricultural hand tools in its collection.

H8 SHEAF BANK WORKS

Gleadless Road, Heeley, Sheffield
SK 353852

Two tall brick blocks survive of this large works, with painted inscription facing the railway 'C.T. Skelton & Co, spades, shovels, forks, manure & digging forks, edge tools, files, steel etc.' Like many Sheffield firms, Skeltons were factors (merchants) as well as manufacturers. Founded 1855, and bought this site 1870. Charles Skelton (1833-1913) is said in the early days to have collected orders in the morning, dressed in frock coat and top hat, changed into working clothes in the afternoon to make the goods. He was Mayor 1894, and knighted 1897. Works built from 1870 using bricks made on the site which were also made commercially at least until 1903. N end of river frontage bears the date 1908. In 1921 much of the site was gutted by fire and rebuilt.

OTHER EDGE TOOLS AND FILES

Files have been included along with edge tools as many firms made both. Sites where there are remains of crucible steel furnaces have been included in the section on Steel.

H9 92, 92A & 94 (CHALLENGE WORKS)

Arundel Street, Sheffield
SK 353868

LSII (92 and 92A) ❖

92A is an early 19thC house facing the street, 92 a workshop at right angles to it. Challenge Works is a late 19thC warehouse with a disproportionately large gateway. These are the remaining buildings of what was once a larger site stretching back to Eyre Lane. Thomas Mottram & Sons, merchants and manufacturers, here 1841. The Co-operative Filesmiths' Society Ltd, steel and file manufacturers, a venture in co-operative production, were on the site c1868-79 and the Filesmiths' Union c1876-87. The Challenge Works building may have been built c1883 for Louis Osbaldiston & Co, 'steel, saws, files etc., mfr and merchant.' Henry Taylor Ltd, edge tool manufacturers, here by 1892 (Acorn Works) making graining combs, files and saws. Their main products were wood carving tools by 1923 and still are today at Lowther Road, Owlerton Sheffield. The present main occupier, cutlers Wall Kay & Sons Ltd, were here by 1922.

H10 BROOKLYN WORKS

Green Lane, Sheffield
SK 349882

Late 19thC two-and three-storey brick buildings, now empty and derelict. Hand forge chimneys in Ball Street, and a splendid plaster sign, (LSII), on the gable by Ball Street Bridge, **Alfred Beckett & Sons Ltd, Steel, Saw & File Works, Corporate Mark Matchless** and an arrow with a D on it. Alfred Beckett established 1839 to make saws, came here 1865 bringing the name 'Brooklyn Works' (reflecting North American trade) from previous premises in Beet Street. Remained here until 1960s, sharing premises with other firms during 20thC. 1948 letterhead advertised cast steel, combined iron and steel, high speed steel, rustless steel and stainless steel, files, circular and band saws, circular cold saws, shear blades, machine knives and circular and cup knives, all manufactured under the 'Matchless' name.

H11 BUTCHER'S WHEEL

72 Arundel Street, Sheffield
SK 355868

LSII ❖

W & S Butcher set up 1819 in Eyre Lane at back of present site where they made crucible steel and edge tools. They became one of the largest edge



H11 1820's building at rear of Butcher's Wheel, Arundel Street, Sheffield *Photo: Derek Bayliss*

tool firms and had a large export trade, particularly to North America. Steelmaking moved to other sites at an early stage. In the early 1850s they acquired the Arundel Street side of the site and built the present works, a large and atmospheric group of buildings round a courtyard with boilerhouse and chimney in middle. The three storey buildings at back and in Eyre Lane probably 1820s. Butchers here until after World War 2; now in use for small businesses, but much of it empty.

H12 CORNISH WORKS

Cornish Street, Sheffield
SK 348883



19thC works with fine gate and door on Cornish

Street. George Barnsley & Sons make shoe knives and leather workers' tools. They date back at least to 1837, when they were file makers, and moved here about 1850. In 1862 they were making files, saws, awl blades, and shoe, curriers' and tanners' knives.

H13 GLOBE WORKS

Penistone Road, Sheffield
SK 348883



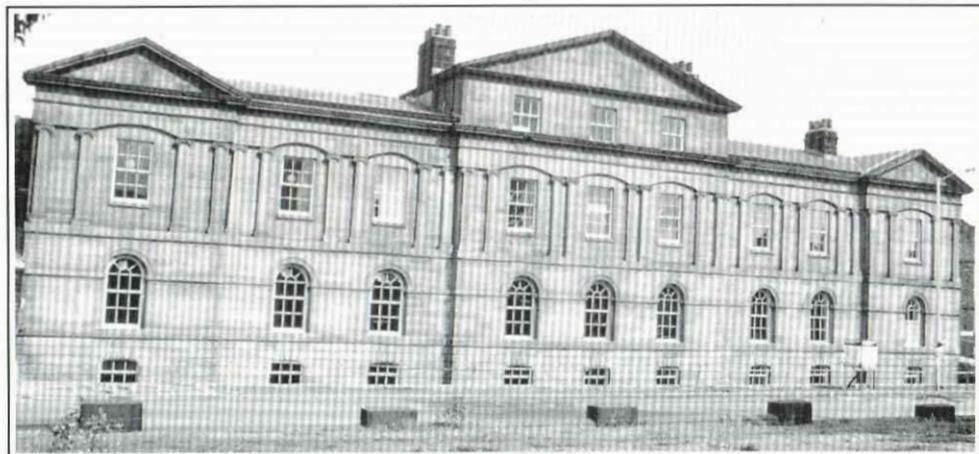
A fine stone classical facade which was the owner's house (R hand end), offices and warehouse. Behind are workshops round a courtyard. Built 1825 for Ibbotson & Roebuck, steel refiners, edge tools, scythes, saws, fenders, and knives. Ibbotson was noted for bad treatment of his employees, and the works was attacked by an incendiary device in 1843, the work of 'ratteners' or saboteurs. He also earned a mention in Engels' *Condition of the Working Class in England*. He died 1852 and the firm left Globe Works 1863. They were followed by the cutlery and edge tool firm of John Walters & Co, which became Unwin & Rodgers 1865 and stayed until 1911. Sheep shear manufacturers Ball Bros were also here 1882-95. Between 1825 and 1973 at least 74 different firms were here, including the last hand cutters of files and rasps (until 1980). In 1978 much of the works was damaged by fire and 1988-90 a £1.5m restoration was carried out; a concrete ring beam was inserted round the roof of the front building to tie it together. Now offices and small workshops.

H14 GLOBE STEEL WORKS

Alma Street, Sheffield
SK 353881



By 1852 Ibbotson Bros of the Globe Works also



H13: Globe Works, Penistone Road, Sheffield

Photo: Derek Bayliss

occupied Globe Steel Works in Cross Smithfield Street. c1861 they moved to Russell Street and 1882 bought the adjoining Sheffield Workhouse in Alma Street dating from 1829. The rendered block on Alma Street is all that remains of the workhouse. The Works is now one of two owned by Richardsons, makers of Laser kitchen knives.

H15 11 HIGH STREET

Ecclesfield, Sheffield
SK 354940

SAM LSII ❖

A single-storey file-cutting shop and a two-storey building, in the grounds of a house.

H16 MEERSBROOK WORKS

Valley Road, Meersbrook, Sheffield
SK 351846

❖

A three storey brick building with pediment enclosing 'three legs of Man' trademark. W wing at right angles; other buildings demolished. Joseph Tyzack & Son Ltd moved here c1885. In 1859 they were steel merchants and in 1876 made plasterers', gardeners' and moulders' tools, saws and reaping machine and chopping knives. Later they concentrated mainly on saws. In 1950 they merged with scythe makers Isaac Nash of Belbroughton, and became Nash, Tyzack Industries Ltd, changing to Brades, Nash and Tyzack in 1957. Taken over by Spear & Jackson, and the works closed and sold in 1980 for use as small workshops.

H17 MOWBRAY STREET

Sheffield
SK 352883

❖

The backs of a series of mid-19thC edge tool and other works can be seen across the Don from the yard of Kelham Island Museum.

From here they are, from the right:

Union Foundry, 41 Mowbray Street. A two-storey block built on a high stone wall facing the river. 11-bay and 4-bay front blocks on Mowbray Street with rebuilt gateway. More 19thC buildings of brick and stone on the E side of the yard. William Shield Norton & Co, iron and brass founders, part of the stove grate trade, here 1865. Now multi-occupied.

Eagle Works, 43 Mowbray Street. The river front is on a stone plinth with a rounded moulding on the top, and some other 19thC buildings survive. W.K. Peace, steel, files, tools etc., here by 1862, on site of a pre-1851 silver refinery. Now multi-occupied.

Bruce Steel Works, 45 Mowbray Street. A four-windowed gable faces the river, with a two-storey brick street frontage. Now the Foundry Climbing Centre. First in the directories 1905/7 as 'Frederick Siemens, steel manufacturer'. Then the

Bruce Crucible Steelworks of Watson Saville & Co Ltd, later C A Saville & Co, though it is doubtful whether crucible steel was ever made there.

York Works, 47 Mowbray Street. Facing the museum is a former grinding shop. Note deposits of 'wheelswarf' (stone and steel particles, the residue of grinding) in the river. The street front is of stone. Mid 19thC buildings with some modernisation. Now occupied by Woodware Repetitions Ltd, making wooden handles for tools.

York Works is the last building on the river front, but next to it in Mowbray Street are some 19thC buildings by the entrance to the former Bruce Works (no. 49), built in the early 1850s for Ashforth Fishbourne Holman & Co, steel, files etc.; and beyond that, in the works of Broadblast at no. 51, a fine bricked-up stone gateway inscribed **Mowbray Steel Works, 1854.**

H18 SPITAL HILL WORKS

Spital Hill, Sheffield
SK 360883

❖

The firm of John Sorby, founded 1767, was making edge tools and sheep shears in the Wicker in 1797, and moved to Spital Hill by 1823 as John Sorby & Sons, merchants and manufacturers of edge tools, joiners' tools, saws, spades and shovels. Lockwood Bros had joined as partners by 1845 and taken over by 1849. They had been in Arundel Street since at least 1828, making files and knives. The John Sorby name and I & H Sorby trademark remained in use. Rebuilt on same site in late 19thC. The Sorby mark and stock were taken over by Turner Naylor in 1931-2. Two long, irregular ranges of buildings of four and two storeys, brick built with stone dressings, now partly empty and deteriorating. The taller building is set into the hillside and parts have vaulted brick ceilings. It has recently suffered fire damage.

H19 STANLEY WORKS

Woodside, Sheffield
SK 352888

The American firm Stanley Tools came to Sheffield in 1936 and bought the industry Tool Works of James A. Chapman Ltd, which had been here since at least 1868 making engineers' tools and braces, malleable ratchet braces, pipe cutters and wrenches, joiners' cramps, breast drills and engineers' hammers. By 1885 it had added army bayonets. The present large modern works built by stages since then. The well-known Stanley knife was developed here. The Surform is also a Sheffield product, developed at Firth Brown Tools c1950 and bought by Stanley.

WOOL

Wool was produced and made into cloth in the area from medieval times. There are place names to remind us of it, such as Walk Mill Weir in Sheffield (walking = fulling) and Tenter Street, in both Sheffield and Rotherham (tenting or tentering = stretching the cloth on 'tenterhooks'). By the 18th century the woollen trade was mainly in the area around Penistone, an outlier of the West Yorkshire industry. The coarse 'Penistone' cloth, usually white, was produced by cottage handloom weavers in this area from at least the 16thC.

J1 PENISTONE CLOTH HALL

Market Place, Penistone, Barnsley MB SE 246033

LSII ❖

Built in 1768 for £800 as a market for woollen cloth woven in the area. Architect John Platt of Rotherham. Stone, two storeys, main front of three bays, arcades of seven round-headed arches (originally open) on north and south. No longer used for wool by 1820s, when it was shops and offices as it is now.

J2 DOMESTIC WEAVERS' COTTAGES

Rock Side Road and Tenter Hill, Manchester Road, Thurlstone, Barnsley MB SE 235035

LSII ❖

Two groups face each other across the bridge and are said to have been rivals. Stone, three storeys high. Each group had a single loomshop on the top floor lit by long mullioned windows.

Others at -

J3 15-19 TOWNGATE LSII

and elsewhere in village, Thurlstone.

Around SE 233036

❖

J4 HILL SIDE

Thurlstone. SE 227027.

❖

J5 JOAN ROYD LANE

Cubley, south of Penistone. SE 246018.

LSII ❖

J6 PLUMPTON MILLS

Thurlstone, Barnsley MB

SE 229033

■

Thurlstone's domestic woollen industry continued until around the First World War. This was one of the few powered woollen mills in the area. Founded 1816 on a corn mill site, powered by water and later steam. It employed 120 men, women and boys in 1861. Thomas Tomasson & Son were producing 'Livery Drabs' in 1891. Closed 1931. The main buildings survive as part of Durrans' blacklead and graphite works (K6) which took them over in 1936.

J7 WOOL MARKET

Market Road, Doncaster SE 576035

LSII □

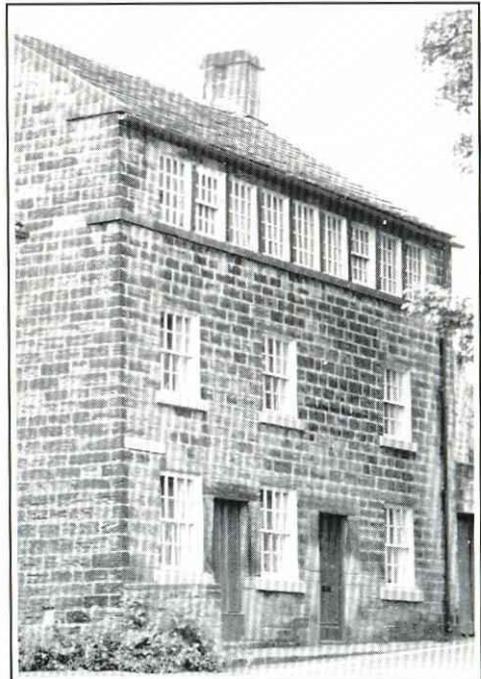
Doncaster was one of the main markets of the wool trade until the late 19thC. Built 1861-3 to the design of John Butterfield, Steward to the Corporation. Single storey, brick wall to the street but iron pillars supporting roof on N and W; spaces between now filled in. Now used as additional hall for general market.

J8 WOOLLEN MILL

Milethorn Lane, Doncaster SE 578044

❖

Large brick mill, early 20thC, now occupied by Don Valley Engineering. Three storeys, two parallel ranges and cross range.



J2: Wool handloom weaver's cottages, Rock Side Road, Thurlstone
 Photo: Ken Webster

COTTON

A water powered silk mill of the 1760s in the Kelham Island area of Sheffield became a cotton mill 1774-1829 when it became the town workhouse. There is still a Cotton Mill Row and Cotton Mill Walk. Other water powered cotton mills were at Stocksbridge (E23) and Ecclesfield (K16), and Conisbrough and Balby near Doncaster also had early cotton mills.

J9 COTTON SPINNING WORKS

off Wood Street, Doncaster
SE 576 032

Edmund Cartwright invented the first practical power loom for weaving broad fabrics in 1784-85, moved to Doncaster, and opened a weaving mill there in 1788-89 (burned down in 1881). A partner-

ship of local men, Copley, Wrightson and Caley, established a factory in 1787, primarily to spin cotton for Cartwright's looms. Later a printing office and then stables; now, much altered and used as workshops and a play centre, behind modern shops and offices on south side of Wood Street.

LINEN WEAVING

Placenames and inventories show that flax and hemp were grown in many parts of South Yorkshire by the 16thC, and no doubt earlier. A linen weaving industry centred on Barnsley began to expand in the 1740s through the enterprise of the Wilson Brothers rather than through any natural advantages. William and John Wilson introduced a system of outworking based on their warehouse in the town and served by their own bleachworks, and introduced skilled workers from textile areas of Lancashire and Cheshire. They were followed by other businessmen, many of them Quakers. Some bought land to build weavers' cottages for rent. Existing cottages and farm buildings were also adapted. Unlike woollen weavers' lofts, linen loomshops were mostly in cellars or basements, where the damper air made the yarn less likely to snap on the loom.

The industry developed mainly in Barnsley itself, where little remains of it, but there were domestic weavers in many of the surrounding villages such as Dodworth and Ardsley, and the bleachworks, which needed good water supplies, were along the valleys of the Dearne and its tributaries.

There was a major expansion in the 1810s through the introduction of the Jacquard loom and the use of higher quality yarns. From 1837 steam-powered weaving mills appeared in the town, though handloom weaving continued to be important. The range and quality of the products was improved by new techniques of dyeing and printing. The industry began to decline with long labour disputes in the 1860s and 70s and competition from Scotland and Ireland. By 1913 only three mills were working, though the last, Redbrook, lasted until 1957. It was rebuilt in the 1950s and survives in other use, but all the older mills have been demolished.

J 10 HANDLOOM WEAVERS' COTTAGES

junction of Strafford Walk & High Street, Dodworth, Barnsley MB
SE 318049

Typical three-storey, purpose built row of three. Probably early 19thC, the surviving part of the 14

cottages of Jackson Square, which was still largely occupied by weavers in 1861. Rear doors and windows modified, and sandstone walls cement rendered; flagstone roofs. 'Basement' loomshops are at street level in front because of sloping ground. At the rear steps led to first floor living rooms. Similar buildings at -

J 11 NIPPING ROW

Hoylandswaine, Barnsley MB. SE 267048

J 12 DARTON ROAD

Cawthorne, Barnsley MB. SE 287081
Two three-storey cottages.

J 13 HANDLOOM WEAVERS' COTTAGES

Top Row, Ardsley, Barnsley MB
SE 383057

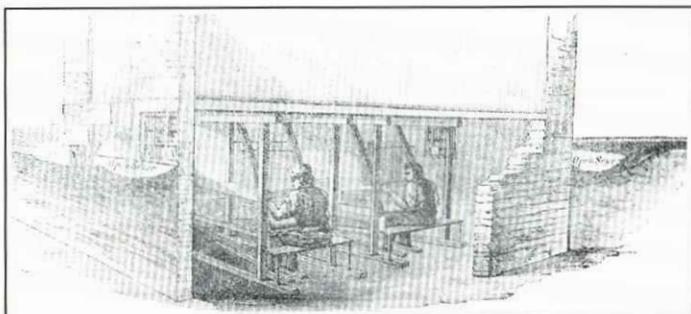
Adaptation of farm buildings, probably c1800. Part demolished for road widening; half the blocked arch of former barn is in west wall of end cottage. Former loomshop at ground level here. Steps lead to former living room on middle floor of east side.



J10: Linen handloom weavers' cottages in Dodworth, from the rear before rendering; note the cellar windows
Photo: Harold Taylor

A linen weaver in a Barnsley weaving cellar, 1852. Note the open sewers on either side

Harold Taylor Collection



J 14 LINEN WAREHOUSE

Dodworth Green, Barnsley MB
SE 309046



Late 18th or early 19thC stone warehouse on three floors, built for Dodworth and Barnsley linen manufacturer Edward Taylor. Converted into two cottages by mid-19thC; note blocked central windows. Adjacent range, now cottages, has blocked arches of former cart-shed, possibly later a warehouse.

J 15 LINEN WAREHOUSE

St Mary's Place, Barnsley
SE 343066



Stone, three floors, slate roof. Coach house and stable on two floors. Built by 1821 for Samuel Cooper. Used by a series of other linen manufacturers until 1882 when bought by John Cass, wholesale outfitter. Now a carpet warehouse.

J 16 GREENFOOT BLEACHWORKS

off Woodstock Road, Barnsley
SE 338081



Bleachworks needed suitable and abundant water, and 'crofting', the exposure of yarn or cloth to daylight for long and repeated periods, made it necessary to avoid the smoke-laden atmosphere of the town. Out-of-town sites were also preferred because of the noxious smell. Greenfoot was established in late 18thC by Joseph Beckett, and used spring water which was stored in Tinker's Pond and the lower pond uphill from the works. Small stone arch marks water outlet; other stone-work includes conduits with slots for water gates. The works buildings have gone but stone revetments show where a large building was added on the banks of the 1800 Barnsley Canal. Later owners included Robert Craik and the firm of Henry Jackson; closed by 1912. Wilthorpe School is on site of the final, much reduced, bleach grounds. Approach from Woodstock Road under railway, or along canal towpath; on private land but most can be seen from public footpaths.

J 17 MIDLAND BLEACHWORKS

Cudworth, Barnsley MB
SE 382089



Established 1854 by Henry Jackson, Barnsley linen manufacturer, to replace his Oakwell (Beevor) bleachworks which was polluted by town smoke. Water from spring fed low level reservoir, and was pumped from there to another reservoir on lower valley slope above buildings. Stone chimney, **LSII**, with 1854 datestone and two small buildings survive. Jackson died 1867 but the firm operated until 1897 at least; closed by 1906. On private land (Bleachcroft Farm).

ARTIFICIAL FIBRES

J 18 DU PONT

Wheatley Hall Road, Doncaster
SE 582045



British Bemberg rayon works of 1929 on industrial estate along W side of Wheatley Hall Road. Prestige main building by Wallis Gilbert & Partners, well known for similar work eg on Great West Road in London. Tall front with Art Deco window frames. British Bemberg in liquidation 1953, works bought by British Nylon Spinners who converted it to make nylon and extended it. Later ICI Fibres and since 1993 Du Pont.

CLOTHING

J 19 UTILITAS WORKS (McLintock & Sons)

Summer Lane, Barnsley
SE 339064



Built 1867, reputedly out of one year's profits, to make 'filled clothing' (quilted shirts, gowns, jackets, smoking caps). Firm founded by James McIntock, a linen warehouseman and son of a linen handloom weaver. Garments filled with silk waste (noils) and later with down which was lighter. Ladies' clothing made from 1900, and 'Victory' lifesaving jackets in World War 2; closed January 1977. Brick, five floors, yellow and blue brick decoration, base of demolished chimney. Now used by Barnsley Chamber of Commerce Training.

CHEMICALS

K1 COPPERAS HOUSE

Ringinglow, Sheffield
SK 293835



Copperas (ferrous sulphate heptahydrate) was important in the early chemical industry as a starting point for making sulphuric acid. By the 19thC it was mainly used as a mordant for black or dark dyes, using iron pyrites found in coal seams, with the coal as fuel. The pyrites was exposed to the atmosphere in troughs or tanks for several years. Ferrous sulphate was formed by oxidation, leached out by rainfall and led to a cistern. The liquor was concentrated by boiling and run to a cooler where the copperas crystallised out. This works was set up on the site of a lead cupola c1800, using pyrites from massive lenses in the adjoining coal mines, and worked probably until the mid 19thC. In 1830 there was one aged employee; visitors were impressed by the stench and pollution. The stone building became a farmhouse, was destroyed by a thunderbolt in the 1920s, and is an unsafe ruin. Behind it are remains of watercourses and the large stone tank and cistern.

K2 COPPERAS HOUSE

Millhouse Green, Barnsley MB
SE 222034



A similar site. The house, reduced from two storeys to one and much modified, is lived in. By it is a large rectangular mound with a stone embankment at the downhill end, said to contain puddled stone beds or pits.

K3 CHEMISTRY COTTAGES

Wortley, Barnsley MB
SK 297997



Site of small works probably for wood distillation to make pyroigneous (acetic) acid, acetone for paints, and charcoal. Row of stone cottages, much modified, and single storey stone building with brick chimneys, which may have been workshop. Similar 19thC works at Totley, Sheffield, now gone.

K4 DISTILLERY ROW

Distillery Side, Elsecar, Barnsley MB
SK 387999



Elsecar Coal Tar Works was operated for Earl Fitzwilliam 1814-18, distilling coal for tar and coke. The tar went to shipyards and other products to druggists, chandlers and ironfounders. There were severe technical problems and the scheme ran into debt. The main buildings have gone but Distillery

Row adjoins the site and a blocked arch in its rear wall suggests that it may be an adapted industrial building. It is a row of four cottages with stone fronts, brick at rear, stone roofs, modified windows and doors.

K5 CRODA HYDROCARBONS

Kilnhurst, Rotherham MB
SK 463984



Bitumen works by canal, originally supplied from local coal carbonisation plants but now from oil refineries. Established by Ellison & Mitchell Ltd 1886 as Don Chemical Works, 1927 part of Yorkshire Tar Distillers, now Croda.

K6 PHOENIX WORKS

Manchester Road, Thurlstone, Barnsley MB
SE 233034



James Durrans & Sons, established 1863 to make blacklead. Stone workshops and a house, Phoenix House. Across the road an 1897 row of houses, Durrans Terrace. Now makes graphite for the nuclear industry, moulders' plumbago for foundries, etc, and since 1936 includes the former Plumpton Mills (J6).

K7 ALBYN WORKS

Burton Road, Sheffield
SK 349885



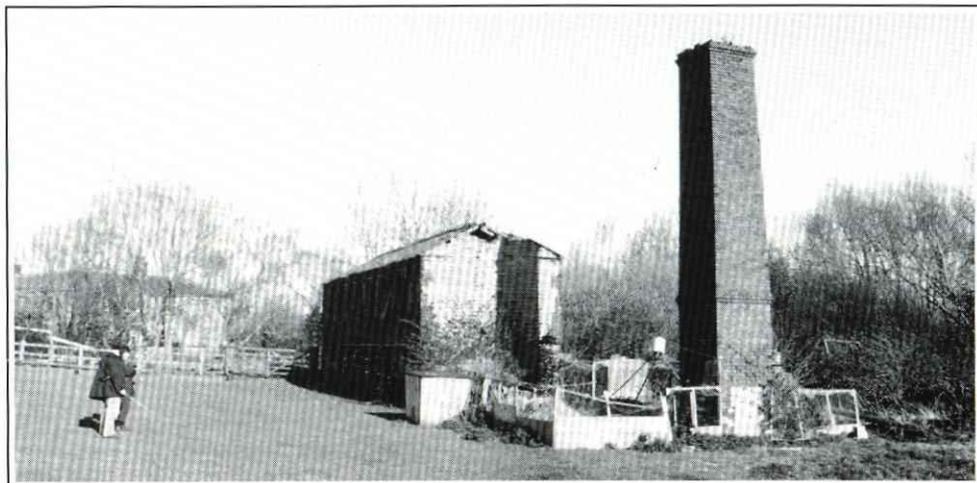
Several Sheffield firms made cleaning powders and pastes for furniture, plates, cutlery, etc. John Needham introduced Needham's Celebrated Polishing Paste in 1824 and died in 1846. The following year Joseph Pickering (1826-1902) married Needham's niece, who had inherited the firm. It prospered, and Albyn Works was built 1875; brick, two and three storeys. Rottenstone and soft soap were made into a paste in an edge runner mill powered by a steam engine, and formed into pats in a pug mill. Other products included harness blacking, plate powder, knife polish, and razor paste. Blanco was invented c1880 by Joseph's son John (1852-97) and became famous, or notorious, when the Army adopted it instead of pipeclay for whitening belts etc. The firm was here until c1970; now the J C Albyn Complex, multi-occupied. In 1900 the family took over a box-making firm owned by a son-in-law, Arthur Truelove, and this is still in business as Joseph Pickering & Sons Ltd in Meersbrook.

K8 VICTORIA PARK WORKS

Valley Road, Meersbrook, Sheffield
SK 351846



A competitor was John Adams, furniture and plate



K10: Cinderhill Tannery, Cawthorne

Photo: Derek Bayliss

powders, in business by 1839 in the city centre and then in Victoria Park near the Botanical Gardens. He built this works about 1886 and the firm was here until the late 1950s. Works taken over by umbrella firm Empire Rib Co who had other premises in the street. Their successors Hoyland Fox and the nursery furniture firm Atcraft (UK) Ltd are here now. Brick gabled workshops and gatehouse, tall 'campanile' chimney.

UPHOLSTERY

K9 137 ARUNDEL STREET

Sheffield
SK 356868

Hair seating, an important trade in 19thC Sheffield, was dominated by the Laycock family. Their larger works have gone but Joseph and Thomas Laycock, Laycock Bros, and Thomas Laycock & Co, in turn occupied these buildings c1825-60. Another branch of the family set up Laycock Engineering (F7). Two-storey brick buildings; house on Charles Street corner, now shop, and workshops and stables behind, later used by cutlery and other trades.

TANNING

K10 CINDERHILL TANNERY

Cawthorne, Barnsley MB
SE 286086

Remains of a small country tannery adjoining Cinderhill Farm. Typical of many rural tanneries which used local oak bark and hides from local beasts. Brick and stone building with pantile roof, stone-lined tanpits fed by stream, later brick chimney. There was a tannery here before 1800, and until 1907.

K11 MEERSBROOK TANNERY

41-65 Chesterfield Road, Meersbrook, Sheffield
SK 350847

Built c.1870 by Francis Colley & Sons, an established firm of curriers and leather dealers in Sheffield. It was the golden age of belt-driven machinery, and Colleys specialised in making the leather belts. The works occupied 2½ acres. The firm went bankrupt in 1908 and only the three-storey street frontage remains, now shops and flats; note roof panels that read **Meersbrook Tannery** and later **Meersbrook Buildings**, and filled-in gateway.

PAPER

A reference of 1611 to a paper mill at Tickhill is the earliest known for Yorkshire, and over 20 of the area's water powered sites made paper at one time or another. Much of it was cheap brown 'rope paper' used to wrap Sheffield cutlery and other local products. One mill, Wadsley Bridge, made white paper, and Spring Grove made newsprint and now makes tissues.

K12 OLD HAY PAPER MILL

Totley, Sheffield
SK 301804

from footpath: ❖

Earliest reference 1653, worked until c1830, then scythe forge until late 19thC. Buildings gone but remains of dams and watercourses.

K13 OLIVE PAPER MILL

Loxley, Sheffield
SK 304895

LSII ❖

Part of a grinding wheel on the River Loxley (G9) rebuilt c1830 as paper mill. £4641 compensation paid after damage in the 1864 flood (L18), though

the stock of rope paper was not damaged. Rebuilt to the present single storey building, disused by 1892. Not far away on the Storrs Brook was -

K14 STORRS PAPER MILL

Storrs Lane
SK 296891

Paper made from c1783 to c1854. Two dams, watercourses and remains of the building around a later house.

K15 RIVELIN PAPER MILL

Rivelin Valley, Sheffield
SK 295873

A cutlery grinding wheel on the River Rivelin, Third Coppice Wheel, converted to a paper mill c1814. From c1854 the mill, owned by the Marsdens, also used the next water powered site downstream, Frank Wheel (SK 300874). Worked until the turn of the century. Buildings gone. At the first site note the weir (using a natural waterfall), overgrown dam, and long tail goit walled from the river to give a greater fall at the wheel; also, by the path up the bank, a small part of a buried boiler or tank sticking out of the ground. At Frank Wheel the weir and overgrown dam and some masonry remain.

K16 PAPER MILL (PRIORY MILL)

off Church Street, Ecclesfield, Sheffield
SK 355946

An old corn mill became a cotton mill by 1794, then a flax mill, and a paper mill 1848. Steam used as well as water power (latterly a turbine), to make rope paper. Closed c1907. Large dam behind Working Men's Club, embanked on three sides, used for fishing. Remains of the foundations and wheelpit.

K17 SPRING GROVE PAPER MILLS

Langsett Road North, Wharcliffe Side, Sheffield
SK 302940

Dates from 1834; in 1855 it was a paper mill, corn mill and grinding wheel, using water power and a new steam engine. Bought 1871 by Peter and Joseph Dixon, who were among the first to use wood pulp for newsprint. This and tissues were their main products. Often rebuilt, notably after fires (1892/99, 1917), and extended. Acquired by British Tissues and now owned by Jamont UK Ltd as Oughtibridge Mills, making toilet rolls and tissues. Mostly modern buildings, but some older ones by the road. It generates its own electricity.

K18 YEWS (EWES) MILL

Firbeck, Rotherham MB
SK 577887

Paper mill by 1675 and until 1848, latterly making

Spurr's Yorkshire Gun Wadding. Also corn mill. Converted to house; waterwheel in living room.

PRINTING

K19 STEPHENSON BLAKE LTD

199 Upper Allen Street, Sheffield
SK 347877

The last traditional printers' typefounder in Britain. Founded 1818 as Blake, Garnett & Co. and bought the plant and founts of the noted London typefoundry of William Caslon. Blake & Stephenson 1829, Stephenson & Blake 1841. Introduced the American system of printers' measurements to Britain. 19thC works; rear wing has been demolished. High quality type is still made, and printers' furniture; typefounding is now a small part of the business.

K20 J W NORTHEND LTD

49 West Street, Sheffield
SK 351873

Firm founded 1889, when there were 51 letterpress printers in Sheffield, by John William Northend, compositor. Its varied work included type specimen printing for Stephenson Blake. This building 1912-14, architects Chapman and Jenkinson. Brick, three floors and basement. Damaged by bombing in World War 2 but rebuilt. Northends left 1988, now Barkers nightclub.

K21 LOXLEY BROS

Aizlewood Road, Heeley, Sheffield
SK 340852

Firm dates from 1851. Moved here 1921 to former roller skating rink. Rebuilt after fire 1923. Specialises in colour printing, greetings cards and gift wrap. Remarkable neo-classical facade - post-modernism *avant la lettre*.



K13: Olive Paper Mill, Loxley, Sheffield after the 1864 Flood
Sheffield City Libraries

GAS

Gas Sheffield had the area's first gas company (Act 1818, supply 1819), followed by Barnsley (Act 1821), Doncaster (Act 1827) and Rotherham (Act 1833). The smaller towns came later, Conisbrough only in 1870. Shortlived competing companies were set up in Sheffield in 1836 and 1850. Industrial companies such as Newton Chambers, and stately homes such as Wentworth Woodhouse and Wortley Hall had their own gasworks. Gas production ended after the introduction of North Sea gas in the 1960s and there are few remains apart from (mainly modern) gasholders.

L1 GAS COMPANY OFFICES

Commercial Street, Sheffield
SK 358875

LSII ❖

Impressive stone building of 1875 in Early Renaissance style, architects M E Hadfield & Son (J F Bentley for glass dome in General Office); brick extension behind. Close to site of 1819 gasworks in Shude Hill. Sheffield United Gas Light Co, later Sheffield and District Gas Co, became largest provincial gas company in Britain. Buildings empty despite successive schemes for reuse.

L2 NEEPSEND GASWORKS

Neepsend Lane, Sheffield
SK 3488

❖

Gas Consumers Co works of 1850. Remains of coal staithes on then newly opened Manchester Sheffield & Lincolnshire Railway, two gasholders including last roller guided one in South Yorkshire (1920). Modern gasholder on site of Effingham Road works of 1836 (SK 363880 ❖), and two at

Wincobank including one of 1938 by Newton Chambers (D16) (SE 389919 ❖). Also one at Old Mill Lane works of 1870 in Barnsley (SE 352072 ❖), two at Dockin Hill works of 1827 in Doncaster (SE 577040 ❖) and two at 1946 Car House works, Greasbrough Road, Rotherham (SK 427941 ❖).

L3 GAS LAMP

Parish Church, Rotherham MB
SK 429929

□

1830s, iron lantern, Gothic stone base, by church S door. Even older oil lamp on circular stone pillar in Wellgate opposite Mansfield Road (SK 431926 □

LSII).

L4 GASWORKS

Station Road, Wath upon Dearne, Rotherham MB
SE 440010

❖

Act 1845. Next to Dearne and Dove Canal. Last traditional chapel-like retort house in South Yorkshire, c1900, red and blue brick; office in similar style.

ELECTRICITY

Electric arc floodlighting was used at Bramall Lane football ground, Sheffield, 1878. Davy Bros and Cammells installed electric lighting in their works 1881. The engineer John Tasker began public electricity supply in Sheffield 1886. This became Sheffield Electric Light and Power Co 1892 and Sheffield Corporation Electric Supply Department 1898. Barnsley, Doncaster, Mexborough and Rotherham built municipal generating stations c1900. Relics include substations (500 in Sheffield by 1948, designed by City Architects; eg Chesterfield Road SK 347826 ❖ and Crookes SK 327876 ❖, (both mid 1920s), and cast iron paving ducts with names of undertakings. Many steelworks, collieries and other industrial concerns generated their own electricity. Spring Grove paper mills (K17) and wind turbines in the Penistone area are believed to be the only generators of electricity in South Yorkshire today.

L5 MEXBOROUGH POWER STATION

Station Road, Mexborough, Doncaster MB
SK 478997

❖

1900, early for an urban district council supply. Replaced 1945 by larger station of Yorkshire Electric Power Co (gone). Two Tudor style buildings including former generating hall.

L6 ELECTRICITY DISTRIBUTION PILLAR

Barnsley Road/Earl Marshal Rd, Fir Vale, Sheffield
SK 363899

□

Ornate circular cast iron structure by British Electric

Transformer Co, Hayes, Middlesex, c1920. Similar ones at Highcliffe Road/Greystones Road, SK 317852 □, and Belgrave Road/Storth Lane, SK 315862 □.

L7 FIRTH BROWN GENERATING STATION

Garner Street/Carlisle Street East, Sheffield
SK 371893

❖

1923, decommissioned 1934. Tall chapel-like brick building.

L8 BLACKBURN MEADOWS POWER STATION

Tinsley, Sheffield

SK 396914

Power stations of 1921, closed 1975, and 1934, closed 1978, both gone. Two cooling towers not yet demolished because close to M1 but expected to go soon.

L9 THORPE MARSH POWER STATION

near Barnby Dun, Doncaster MB

SE 6009

Only large station in South Yorkshire built by Central Electricity Generating Board 1958-66 to feed National Grid. Closed 1994. Cathedral scale generating hall with two groups of generators, six cooling towers.

WATER

Before piped water supplies, people obtained water from streams, springs, wells, pumps and boreholes. Many wells and pumps remain. Small reservoirs were made in or near towns from the 15thC (cf the name Barkers Pool in Sheffield) and larger ones by companies and local authorities in moorland areas from 1830 to give purer water and greater supplies. Some of the area's water now comes through links from reservoirs in the upper Derwent valley in Derbyshire and by abstraction from the Yorkshire Derwent.

L10 ROBIN HOOD'S WELL

Burghwallis, Doncaster MB

SE 519119

Designed by Vanbrugh and built by Earl of Carlisle 1711. Four rusticated limestone arches, stepped top. Now in layby on southbound A1.

LSII □

L11 SPOTBOROUGH PUMP

Sprotborough, Doncaster MB

SE 539017

George Sorocold installed pump from Don 150ft up to Hall for Sir Godfrey Copley c1700. Remains of more recent water powered pump by the Don.

LSII ❖

L12 PUMP

Station Road, Rossington, Doncaster MB

SK 623984

Tall octagonal Gothic structure with low spire. Flywheel on projecting axle, gear wheel and crank linked to pump rod.

LSII □

L13 PUMP

66/68 Greenhill Main Road, Greenhill, Sheffield

SK 345812

Circular iron pillar with spout and handle, now 'dressed' each spring in the Derbyshire tradition.

□



L18: The power of water, Rowell Wheels, Loxley valley, Sheffield (see G9) after the 1864 flood caused by dam bursting at Dale Dike

Photo: Sheffield City Libraries

L14 PUMP

Rock Inn, Green Moor, Barnsley MB
SK 282995 ❖

Stone and timber building, pump worked by turning wheel. Old grindstone to put bucket on. 1909, restored 1984.

L15 WIND PUMP

near Hampole, Doncaster MB
SE 499107 ❖

Once common but disappearing. This one, about 20ft high, stands in fields near A638 and pumped up water.

L16 REDMIRE RESERVOIRS

Redmires, Sheffield
SK 2585 and 2685 ❖

Sheffield Waterworks Co set up by Act 1830. Built Redmires Middle Reservoir 1833-6 at 1105ft. 4½ mile open stone conduit to Hadfield service reservoir, Crookes (SK 331875 ❖), which was covered 1949 and has sports ground on top. Conduit piped 1909; footpath along W part of open channel, bridges etc to see. Two more reservoirs 1849/54 and 2¾ mile catchwater drain N and W on Hallam Moors, lower part a footpath. At its outfall (SK 260857) circular weir and 1854 cast iron bridge by Wilson & Robinson, Eagle Foundry, Sheffield Park. Engineer for scheme J Towleron Leather (1804-85) with John Fowler as pupil in 1830s (1817-98, born Sheffield, later famous railway engineer – Metropolitan Railway, London; Forth railway bridge).

L17 RIVELIN RESERVOIRS

Rivelin, Sheffield
SE 2786 ❖

1848. Tudor style manager's house (Old Dam House). 1914 filter house in Classical style SK 285869 ❖. Reservoir linked by covered conduit (part in tunnel) to Godfrey Dam at Crookesmoor. 1910 tunnel, 4⅓ miles long, brings water from Derwent valley dams; sighting pillar for it by Redmires catchwater drain (SK 260865 □) and surveyors' cabin on Stanage Edge at 1465ft (SK 225862 □).

L18 LOXLEY VALLEY RESERVOIRS

Bradfield, Sheffield
SK 2290 to 2890 ❖

Dale Dike Reservoir (SK 2491) 1864, engineer Towleron Leather. Original dam burst 11 March 1864, torrent of water down valley to Sheffield killed around 240 people and led to major inquiry into circumstances and safety of earth dams. Site of that dam marked by stones inscribed **C.L.O.B.** (centre line of bank). New dam upstream built 1875 (cast iron footbridge of 1875 over bywash channel), not used until 1887. Agden 1869, Strines 1871,

Damflask 1867 but not commissioned until 1896. 2¼ mile tunnel under Ughill Moors 1869 (closed 1935) to link to Rivelin system and take water to Sheffield. 1914 filter house at Low Bradfield. The city later built Langsett (1905) and Underbank (1907) reservoirs (and Barnsley built Midhope 1904) in the Little Don valley (SE 2000 to SK 2599 ❖), and Broomhead and More Hall (both 1929) in the Ewden valley (SK 2625 to 2825 ❖). Further Victorian reservoirs for Barnsley (Ingbirchworth 1878, Royd Moor and Scout Dike) and Dewsbury in valleys of upper Don and tributaries.

L19 SHEFFIELD WATER WORKS COMPANY OFFICES

Division Street, Sheffield
SK 350872 ❖

1867, Italianate with carvings of Gods of water, architects Flockton & Abbot. Town Council acquired Company 1887. Now empty.

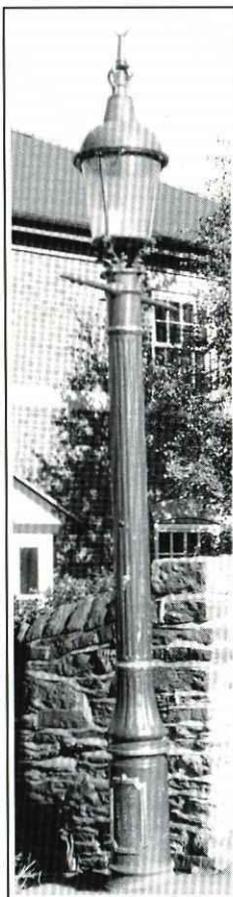
L20 RIVELIN BANK PUMPING STATION

Rivelin Bank, Malin Bridge, Sheffield
SK 326892 ❖

1942 to pump from Loxley Valley system to Hadfield service reservoir. Now electric. Rare 250hp 4-cyl Blackstone Brush diesel engine of 1940/41 on standby. Occasional open days.

SEWERAGE

The South Yorkshire towns discharged their sewage into rivers until the late 19thC and were late in providing sewerage works (Sheffield 1884) and in replacing night-soil collection by domestic sewers – about 16,600 Sheffield houses were unconnected in 1915.



L22: Webb patent sewer lamp, Cemetery Road, Sheffield (see over)

Photo: Derek Bayliss

L21 BLACKBURN MEADOWS SEWAGE WORKS

Tinsley, Sheffield
SK 3991

1886, engineer Gustave Alsing (cf Alsing Road). Linked to programme of building interceptor sewers. Enlarged 1909-14. Problems led manager John Howarth to introduce bio-aeration system - continuous channel of water moved to and fro by paddles which introduced oxygen. Widely adopted nationally as 'Sheffield System'. Experimental bed 1916, main beds 1922-27. Now obsolete (still used at Aldwarke, Rotherham) but channels, paddle boxes and brick motor houses can be seen from railway. Brick workshop c1900 and offices.

L22 WEBB PATENT SEWER LAMP

Eldon Street/Broomhall Street, Sheffield
SK 348872

Patented by J E Webb & Co, Birmingham, 1895. Burned town gas to draw foul and potentially explosive gases from sewers. Sheffield had 84, believed to be greatest number in any British town. 18 have been preserved; one at top of Cemetery Road (SK 341857) etc.

L23 HOLMES SEWAGE PUMPING STATION

Whittington Street, Doncaster MB
SE 578041

c1920, surprising classical stone building with pediment, pumps to Wheatley Hills sewage works two miles away.

13 TRANSPORT

ROADS

Roman roads have been excavated at Templeborough, Rotherham, but there is little visible evidence of them in South Yorkshire except some alignments. There are more remains, including stone paved 'causeys', bridges and guideposts, from the area's important packhorse routes, especially in the western moorland areas where some were not enlarged for wheeled traffic. The Great North Road was one of the first to be turnpiked, and other main routes were turnpiked or built new during the late 18th and early 19thCs. Besides tollhouses and other remains, they have left us several series of milestones (not detailed here). In the 20thC the road system has been transformed for motor traffic, most recently with the construction of the M1 and other motorways and fast roads.

M1 WILLOW BRIDGE

Oxspring, Barnsley MB
SE 267026

Typical packhorse bridge, 1730s?, across Upper Don on route from moors to Silkstone and Wakefield. Now on bridleway in wooded setting.

M2 DYSON COTE GUIDE POST

Hunshelf, Barnsley MB
SE 258004

Hexagonal stone post of 1734 at route junction, showing distances in five directions, including the same Wakefield route as at Willow Bridge and route over Pennines from Woodhead to Sheffield and Rotherham.

M3 CAUSEY

Gunthwaite, Barnsley MB
SE 2405

Good examples of stone paving over boggy

ground between Gunthwaite, Cat Hill and Wellhouse Farm on route to Penistone.

M4 WATERING PLACE

Watering Place Lane, Thurlstone, Barnsley MB
SE 234034

Stone troughs for watering packhorses coming down from Pennines.

M5 SALTERSBROOK BRIDGE

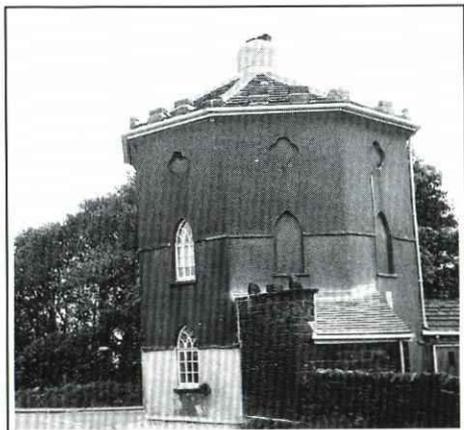
Dunford Bridge, Barnsley MB
SE 137002

Restored turnpike bridge, 1730s?, later replaced by larger bridge higher up valley. Name reflects old salt route from Cheshire.

M6 RINGINGLOW

Sheffield
SK 291838

Octagonal Gothick Barber Fields Cupola tollhouse (LSII) c1795 where 1758 turnpike from Sheffield



M6: The Roundhouse at Ringinglow, Sheffield
Photo: Ken Webster

divided to Fox House and Buxton and to Hathersage and Chapel-en-le-Frith. Now known as 'The Round House'. Norfolk Arms (**LSII**), battlemented to match, built early 19thC for turnpike traffic. Houndkirk Road, from SK 290835 to 270805, is original Buxton turnpike, replaced by present A625 1812, with remains of original surface, embankments, culverts and a bridge.

M7 PITSMOOR TOLLHOUSE

Burngreave Rd/Pitsmoor Rd, Pitsmoor, Sheffield SK 356894 **LSII** ❖
 On Sheffield-Barnsley-Wakefield-Leeds turnpike of

1758. Built 1836, tolls ended 1876. Stone, single storey, half octagon and rectangular cottage.

M8 TAKE OFF STONE

Mortimer Road, S of Penistone, Barnsley MB SE 246006 **LSII** □

Mortimer Road was an unsuccessful turnpike from Grindleford in Derbyshire over moors to Penistone. Built 1770s with steep ascents and descents (as here), given up early in 19thC. Stone shows where extra horse helping heavy loads up hill was unhitched. In W verge 200 yards S of crossroads, 1026ft asl. Similar one 100yds N of Strines Inn (SK 222906 □).

M9 TOLLHOUSE

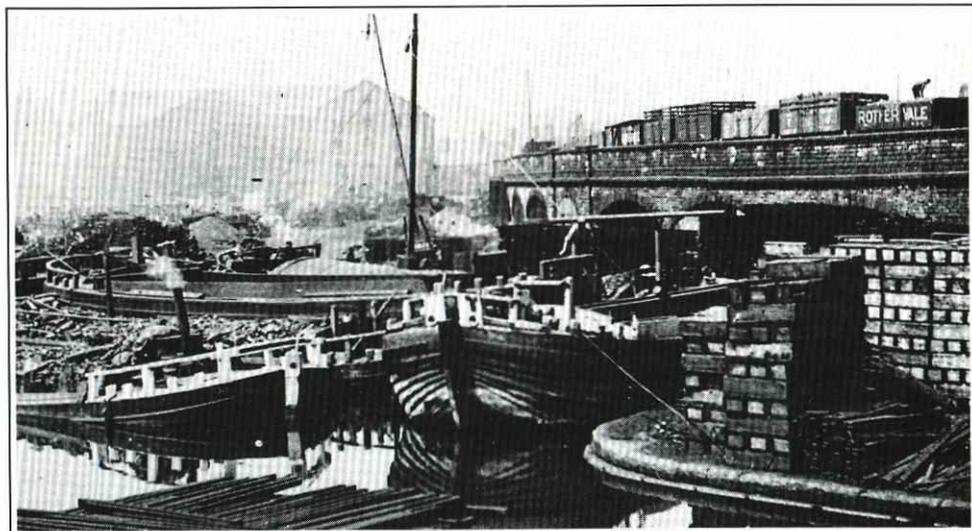
Norton, Doncaster MB SE 564149 **LSII** ❖

Single storey half-octagon with small wings, now garage, on the A19. At Toll Bar, Bentley (SE 562078 ❖), on same road a much altered two storey tollhouse, now Toll Bar Motors.

M10 NORTH BRIDGE

Doncaster MB SE 572036 □

Great North Road crossed Great Northern Railway main line on level until 1909-10. Growing delays and need to link two parts of town's electric trams led to building of bridge. Cast iron central span over railway and canal, John Butler, Stanningley Iron Works, Leeds, 1910; blue brick arches, rebuilt 1993.



M15: Sheffield Canal Basin in 1887. Note iron bars and coal on barges. Terminal and Grain Warehouses in background, before Straddle Warehouse was built
Photo: Sheffield City Libraries

M11 BAILEY BRIDGE

off Eldon Road, Rotherham MB
SK 436940

Pedestrian bridge over River Don, refurbished 1992 in memory of Sir Donald Bailey, inventor of this type of bridge, who came from Rotherham. Ten sections, by Appleby Frodingham Co, Scunthorpe. Over 4,000 Bailey bridges used in World War 2.

M12 TINSLEY VIADUCT

Tinsley, Sheffield/Rotherham
SK 3991

Box girder viaduct on two levels carrying M1 and local roads across Don valley. Impressive structure, reinforced after collapse of other box girder bridges in 1970s.

CANALS

The Don, navigable to Doncaster, was improved by the River Dun Navigation Co to Aldwarke 1733, Rotherham 1740, Tinsley 1751. A road linked it to Sheffield until the Sheffield Canal opened 1819. The area's first canal was the narrow Chesterfield Canal, planned by James Brindley and opened 1776. It was followed by the Dearne and Dove Canal, from Swinton on the Don to Barnsley (1804) with branches serving the coalfield at Elsecar (1798) and Worsbrough; the Barnsley Canal from the Calder to Barnsley (1799) and Barnby Basin (1802); and the Stainforth and Keadby Canal (c1802) which took much of the Don's traffic via Thorne to the Trent and Humber. The 5½ mile New Junction Canal of 1905, the last new canal in Britain, linked the Don to the Aire and Calder. Modernisation of the Don as the Sheffield and South Yorkshire Navigation, completed 1983, has taken away much of its character and not brought much new traffic.

M13 NORWOOD LOCKS AND TUNNEL

Wales/Kiveton Park, Rotherham MB
SK 4681 to 5082

Brindley's Chesterfield Canal climbed from Rother valley by 13 locks in three staircases of three and one of four. Boatman Inn at foot and former sawmill, water powered from side pond, are now houses. Tunnel, 2893 yards long, closed by mining subsidence 1907. Both portals visible, SK 474819 and 500825. Feeders from four reservoirs near Harthill (SK 4780 and 4880) enter near both portals.

M14 PUDDING DIKE BRIDGE

Thorpe Salvin, Rotherham MB
SK 529815

Typical brick bridge dated 1804 on springing arch. East of this Thorpe Locks or 'Giant's Staircase' (SE 5381 □ LSII), 15 locks including two double and two treble staircases, and Turnerwood Locks (SE 5481 □ LSII), seven single locks. Mileposts 16 and 17 from Chesterfield (LSII); canal and quarrying hamlet at Turnerwood.

M15 CANAL BASIN, Sheffield

SK 360877

Terminal Warehouse 1819 (LSII*), four storeys, brick. Open arch on basin side for barges to load under cover. Joining it at right-angles, Grain Warehouse c1880, brick, with canopy, bucket elevators, grain hoppers inside. Straddle Warehouse 1895, steel frame with blue brick and stucco; five barges could unload here. Stone canal cottages and coal offices, railway arches. Current programme of restoration for boating and other uses, new office blocks. Original dry dock dug out and restored, coal drop restored.

M16 DARNALL AQUEDUCT

Worksop Road, Attercliffe, Sheffield
SK 384887

Three arch ashlar stone aqueduct, 1819. Typical stone canal bridges of 1819 with brick parapets at Cadman Street, SK 365880 □ LSII, and Bacon Lane, SK 374883 □ LSII.

M17 TINSLEY LOCKS

Tinsley, Sheffield
SK 3989, 3990

11 locks (originally 12) down to River Don. Top lock has original 1819 chamber and pipe for pumping up water from Don.

M18 FERRY LANDING

Mexborough, Doncaster MB
SK 482996

Access from Ferry Lane Best of several former ferry landings on River Don. Led to footpath to Old Denaby; now footbridge. Stone sett ramp, winch, flood marker stone, stone inscribed **Ask for boat at cabin.**

M19 LOCK CHAMBER

Strawberry Island, Milethorn Lane, Doncaster MB
SE 579045

c1750, long since bypassed.

M20 BRAMWITH LOCK

Kirk Bramwith, Doncaster MB
SE 621114

Lengthened 1932 for 'Tom Puddings' (coal container boats worked in trains). Three pairs of gates, lower pair winch operated, traffic lights, lock house, swing bridge (LSII) so sailing keels could pass without lowering masts. 18thC stone road bridge over drain in Low Lane (SE 620117 □ LSII) with Roman numerals, not in sequence, carved on stones on SE side.

M21 DON AQUEDUCT

Kirk Bramwith, Doncaster MB
SE 614113

1905 on New Junction Canal. Steel channel, blue brick abutments and central pier. Channel is at water level, surplus cascades over to river. Raised towpath, guillotine gates at each end.

M22 STAINFORTH

Doncaster MB
SE 6412

Start of Stainforth & Keadby Canal. Many canal families lived here. Until 1939 locks from Navigation into Don. Lock cottages, basin now enlarged as moorings. Dry dock on S of canal at SK 640120

M23 WATERSIDE

Thorne, Doncaster MB
SE 6713 and 6714

Former wharf on River Don for transhipment between keels and larger vessels. Stone wharf wall (LSII), cottages, John Bull pub named after paddle steamer that plied to Hull.

M24 BAY OF BISCAY AQUEDUCT

Wath upon Dearne, Rotherham MB
SE 433010

Twin arched stone aqueduct at former Wath wharf carried Dearne and Dove Canal, now filled in, over Brook Dike and footpath. Aldham Aqueduct, Wombwell, SE 386043, three arches, stone, carried Canal across River Dove; now dry.

M25 DEARNE AQUEDUCT AND JUNCTION LOCK

Dearne Valley Country Park, Barnsley MB
SE 357068

Restored stop lock chamber where Dearne and Dove Canal joined Barnsley Canal, section in water, foundations of tollhouse, the four stone piers of former Barnsley Canal aqueduct across R. Dearne.

TRAMROADS

Wooden railed, horse worked wagonways were in use from the Duke of Norfolk's Sheffield Park Colliery to the town by 1720s and from several collieries to the River Dun Navigation in 1740s. Flanged iron rails to carry unflanged wheels, invented by John Curr in Sheffield for use underground, were used for tramroads in 1790s, and iron edge rails with flanged wheels by 1820s. In 1830s there were three lines of some length at Silkstone, Worsbrough and Thorncliffe-Elsecar, and many shorter ones. Most linked collieries to a canal or river navigation. Parts of many of them can be explored on foot.

M26 SILKSTONE RAILWAY

Silkstone, Barnsley MB
SE 289053 to 302080

1809, two miles from collieries to Barnby Basin at



M26: Stone sleepers on the Silkstone Tramroad

Photo: Ken Webster

head of Barnsley Canal. Closed 1860. All now bridledway. Stone blocks or sleepers to carry rails remain in place around Silkstone (laid as diamonds) and Low Mill. S extension, c1830, 1½ miles to Silkstone Common and Huskar Colliery, with cable incline, not right of way. Examples of rails in Cawthorne Diamond Jubilee Museum.

M27 BROOMROYD TUNNEL

Rockley, Barnsley MB
SE 328021

30 yard tunnel, now bat refuge, under former drive to Wentworth Castle on 1820 Worsbrough Railway from Worsbrough basin on Dearne and Dove Canal 3½ miles to collieries at Crane Moor. Later 2 mile branch to Pilley Hills.

M28 TRAMROAD BRIDGE

Town Lane, Greasbrough, Rotherham MB
SK 407957

Twin arched stone bridge under road for the Fentons' Whitegate colliery tramroad of 1763 or a successor. There were tramroads from 1747 in the Parkgate and Greasbrough area.

RAILWAYS

Sheffield and Rotherham were linked by steam railway (S&R) 1838. The North Midland Railway (NMR) from Derby through Rotherham to Leeds, engineer George Stephenson, opened 1840 and linked the area with the growing national network. The Sheffield, Ashton under Lyne and Manchester Railway (SA&M) opened its impressively engineered main line across the Pennines in 1845, and became the Manchester Sheffield and Lincolnshire

Railway (MS&L) in 1847 and the Great Central Railway (GCR) in 1897. From 1845 a dense network was built in South Yorkshire, including main lines across the area like the Great Northern Railway (GNR, 1849) and local lines competing particularly for coal traffic. Only a few of the many interesting railway buildings and structures in the area can be mentioned here.

M29 WICKER STATION

Savile Street/Spital Hill, Sheffield
SK 360882

S&R terminus became goods station 1870 when direct line through present Sheffield station to Chesterfield and London opened. Closed 1965. Stone gate pillars, arcaded retaining walls, stone sett horse ramp to stables across Spital Hill. East portal of 1847 tunnel to S A & M at Bridgehouses; more impressive W portal, SK 357882 ■ **LSII**.

M30 S&R COAT OF ARMS

Boston Park, Boston Castle Grove, Rotherham MB
SK 430915

Moved here from S&R Rotherham Westgate terminus (gone). Most of S&R route can be seen from here on good day.

M31 ICKLES VIADUCT

Rotherham MB
SK 418920

Low stone viaduct of 1840 carried NMR across Don valley. Later widened and altered.

M32 LOCKE STATUE

Locke Park, Barnsley MB
SE 340054

Joseph Locke (1805-60) was a leading member of the first generation of main line railway engineers. Born Attercliffe, Sheffield, brought up Barnsley. Engineer of S A & M including Woodhead Tunnel, and other main lines in Britain, France, Spain and Netherlands. Widow presented Park and statue by Baron Marochetti 1861 in Locke's memory. Locke Tower (1877, **LSII**) in Park commemorates her.

LSII □

M33 WOODHEAD TUNNEL

Dunford Bridge, Barnsley MB
SE 156023

Three miles 22 yards under Pennine watershed from Woodhead, longest railway tunnel in Britain (if not world) when built. Work began Sept 1839, remarkable both for engineering difficulties and for problems of employing up to 1500 navvies in wild moorland area. Single line tunnel opened 22 Dec 1845, parallel tunnel built 1847-52. Both closed 1954 when new double track tunnel opened for Manchester-Sheffield and Wath electrification; this tunnel closed 1981. Earlier tunnels now carry transpennine electricity cable. Observatory and ventilators survive on the moors.

M34 PENISTONE GOODS STATION

St Mary's Street, Penistone, Barnsley MB
SE 245034

Six stone coal drops, 1845?, **LSII**. Later goods shed and offices. First passenger station was also here (gone); 1874 one at SE 251033 ♣ in use on Lancashire and Yorkshire Railway's (LYR) 1850 Huddersfield line. N of it on that line Penistone Viaduct SE 2503 ♣, **LSII**, 1850, 1100ft long, 98ft above Don, 29 gently curving arches.

M35 WORTLEY STATION

Wortley, Barnsley MB
SK 298992

MS&L 1888, large as Lord Wharnccliffe of Wortley Hall was company chairman. Deepcar station (SK 293978) 1865 in gloomy Tudor style.

M36 OUGHTIBRIDGE STATION

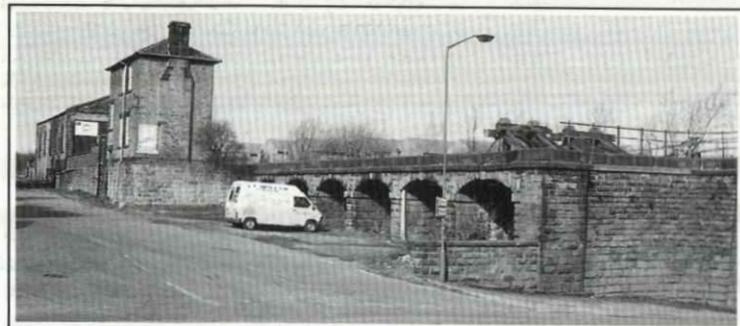
Station Lane, Oughtibridge, Sheffield
SK 312935

SA&M 1845, in Tudor style of a village school with coped gable, kneelers and mullioned windows.

M37 WICKER VIADUCT and VICTORIA STATION

Sheffield
SK 3588, 3687

1849 as start of MS&L extension to Lincolnshire.

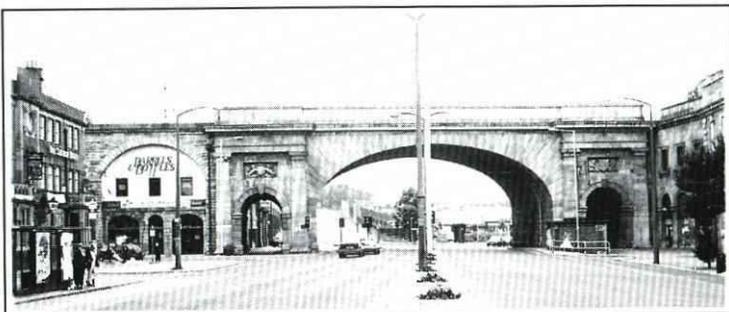


M34: Coal drops and goods station, Penistone

Photo: Ken Webster

M37: The Wicker Arch,
Sheffield, 1849

Photo: Ken Webster



660 yards long, crossing Don valley on 40 stone arches 40ft high. Huge structure by standards of time. Includes Wicker Arch (**LSII***), impressive ashlar 72ft arch over then main N approach to Sheffield, with coats of arms of MS&L, Earl of Yarborough, Duke of Norfolk and Sheffield Town Trustees. GCR World War 1 war memorial, 1304 names, relocated in E pedestrian arch. Sheffield Victoria Station (1851-1970, mainly demolished) was on viaduct. 12 arched approach ramp and Victoria Station Hotel (1862). Building for lift to platforms at E side of Wicker Arch.

M38 NUNNERY GOODS STATION

Bernard Road, Sheffield
SK 367877

London and North Western Railway 1895, on short goods branch from MS&L. Goods offices, manager's house. Stables with king post roof, hay baskets and small windows.

M39 SHEFFIELD MIDLAND STATION

Sheaf Street, Sheffield
SK 358870

Buildings on platforms 2-8 1870 for new direct main line to London. Impressive street front with porte cochere and stationmaster's house and buildings on platform 1 1905, (**LSII**), architect Charles Trubshaw. Heeley Station (SK 351850 ❖ 1870) and Dore Station (SK 324813 ❖ 1872) also for new line, as was Don Valley viaduct (SK 3688 and 3788 ❖), ½ mile long, six stone and 44 blue brick arches, segmental iron arch over Attercliffe Road.

M40 MILLHOUSES LOCOMOTIVE SHED

Millhouses, Sheffield
SK 342837

1901, four bays, now engineering workshop.

M41 TOTLEY TUNNEL

Totley, Sheffield
SK 307802

Midland Railway Hope Valley line from Sheffield to Manchester opened goods 1893, passengers 1894. Tunnel 3 miles 950 yards, longest steam railway tunnel under land in Britain. Five ventilators

with spoil heaps, collapsing summit observatory (SK 278795 □). Below tunnel mouth Old Hay Brook carried over line in elliptical open brick aqueduct (SK 310803 ■). Original Midland signal box and footbridge at Totley Tunnel East (SK 314804 ❖).

M42 MEXBOROUGH STATION

Mexborough, Doncaster MB
SK 473996

LSII ❖

MS&L 1871, Jacobean style. Brass World War 1 memorial to GCR Mexborough railwaymen.

M43 CONISBROUGH VIADUCT

Conisbrough, Doncaster MB
SE 5299

Dearne Valley Railway, Wakefield to S of Doncaster, built 1905-9 and worked by L&YR. One of several new lines after 1900 largely for traffic from concealed coalfield. Viaduct over Don Gorge 1907, 1525ft long, 113 ft high. 21 blue brick arches, lattice steel span (John Butler, Stanningley Iron Works, Leeds) across river.

M44 DONCASTER STATION

Trafford Way, Doncaster MB
SE 571032

GNR's original buildings in Italianate style on platforms 1-3. Locomotive Works (F13) to west. Neo-Georgian front range 1933 by London & North Eastern Railway, **LSII**. Locomotives built here and other aspects of town are illustrated in subway. At SE 572028 ❖ St James's Church, 1858, funded by subscription by GNR shareholders and designed by chairman's son Lord Grimthorpe. 1890 memorial (**LSII**) given by railwaymen for 70th birthday of Patrick Stirling, GNR locomotive engineer 1866-95, moved to Barnstone Street, Hexthorpe, Doncaster (SE 564023 □).

M45 CARCROFT AND ADWICK STATION

Adwick-le-Street, Doncaster MB
SE 543088

West Riding & Grimsby Joint Railway (MS&L and GNR), 1866. Limestone, canopy, turreted tower. Now builders yard; brand new station across road.

M46 NORTON STATION

Norton, Doncaster MB
SE 555153 ❖

On 1848 L&YR line from Knottingley to GNR's north end 'in a field north of Doncaster' at Askern Junction. 1848, brick, rather like a Swiss chalet.

M47 THORNE ORCHARD STREET

Thorne, Doncaster MB
SE 685131 ❖

South Yorkshire Railway, linked with River Dun Navigation, built lines from Doncaster to Swinton 1849, Elsecar 1850, Barnsley 1851, Barnsley to Sheffield 1854. Doncaster to Thorne 1855-6 and Keadby 1859 lightly laid along side of Navigation, replaced by present line 1866. Before this, house W of Orchard Street was station house and brick cottages opposite were station, N of line. Thorne North Station (SE 680138 ❖), North Eastern Railway 1869; Iron footbridge.

M48 CORONATION BRIDGE

Templeborough, Rotherham MB
SK 416918 ■

Industrial railway of Steel Peech & Tozer Templeborough steelworks crossed Don on pioneer pre-stressed concrete railway bridge of 1953, now disused.

TOWN TRAMS

Once people lived more than walking distance from where they worked, trams were the main means of travel to work in this area for the large numbers at the main urban industrial sites. Sheffield was famous for its trams (horse 1873, electrified 1899-1902, closed 1960). Its new Supertram, being opened by stages 1994-5, is the first modern British light rail system to have street running with ordinary traffic. There were municipal electric tram systems in Rotherham (1903-49) and Doncaster (1902-35) and two companies, the Barnsley and District Electric Traction Co (1902-30) and Mexborough and Swinton Tramways Co (1907-29). The short-lived Dearne District Light Railways (1924-33) linked the coalmining area between Swinton and Thurnscoe with Barnsley and were jointly owned by four urban district councils. Rotherham was a pioneer of Trolleybuses (1912, from Maltby to Broom tram terminus).

M49 TINSLEY TRAM DEPOT

Attercliffe Common/Weedon Street, Tinsley, Sheffield
SK 392903 ❖

1874 for horse trams, extended 1899, for electric trams; **SHEFFIELD TRAMWAYS COMPANY** inscription on oldest part. Now Sheffield Bus Museum (Z3).

M50 HEELEY TRAM DEPOT

Albert Road, Heeley, Sheffield
SK 352847 ❖

Horse tram depot and stables inscribed **SHEFFIELD TRAMWAYS COMPANY** and 1878. Closed when trams electrified, now car repair business.

M51 KELHAM ISLAND TRAMWAY GENERATING STATION

Kelham Island, Sheffield
SK 352883

1899, to electricity undertaking 1914. Now Kelham Island Museum (Z4).

M52 SHOREHAM STREET TRAM DEPOT

Leadmill Road/Shoreham Street, Sheffield
SK 357868 ❖

1910; spiky turrets frame former entrance. Greatly extended for buses, which used it to 1994, in contrasting Art Deco style. Now empty, future uncertain.

M53 BARNSELY TRAM DEPOT

Upper Sheffield Road, Barnsley MB
SE 353051 ❖

1902, rebuilt. Now main garage of Yorkshire Traction ('Tracky'), the bus company that developed from Barnsley tram undertaking.

M54 DEARNE DISTRICT TRAM DEPOT

Brampton Road, Wombwell, Barnsley MB
SE 409023 ❖

1924, known in American style as 'carbarns'. Rebuilt, now Yorkshire Traction bus garage.

OTHER ROAD TRANSPORT

Two buildings to represent the largely unexplored building history of horse drawn road transport and early motoring in the area.

M55 BOROUGH MEWS

Bedford Street, Sheffield
SK 346884 ❖

Stables, coach houses, workshops and stores for Joseph Tomlinson, horse cab and horse bus operator and funeral director. Late 19thC, roofed yard with wrought iron roof structure, supported by three blocks to left and parallel three storey and basement block to right Offices, chapel of rest, house and gateway facing street.

M56 CAVENDISH BUILDINGS

West Street, Sheffield
SK 348873 ❖

Showrooms and garage, now Kennings. Three storeys, brick and elaborate terracotta with date plaques 1919 - 1907 - 1910.

Z1 ABBEYDALE INDUSTRIAL HAMLET

Abbeydale Road South, Sheffield S7 2QW.

Phone: (0114 236 7731)

SK 326820

Open Tues-Sat 10.00-5.00, Sun 11.00-5.00 and Bank Holiday Mons. Admission charge.

Restored 18thC scythe and crucible steel works. (See nos. E7 and H1). Four working water wheels and associated machinery. Restored 1855 horizontal steam engine. Workmen's cottages and Manager's House. Displays of agricultural hand tools and their manufacture. Working demonstrations. Temporary exhibitions.

Z2 ELSECAR AT BARNSELY

Elsecar Workshops, Wath Road, Elsecar, Barnsley S74 8HJ.

Phone (01226) 740203

SK 385999

Open daily except Christmas and Boxing Day, 9.00-5.00. Opening times and admission charges vary for different attractions - the Hot Metal Press is free.

The Workshops, see no. B2, have been restored for a range of exhibitions and small businesses. The former include The Elsecar People (local history), The Powerhouse (interactive science exhibits), the Hot Metal Press (working museum of printing, phone (01226) 740498) and the Bottle Collection (bottles, packaging, the local glass industry, phone (01226) 745156). Steam railway on former mineral branch line. The Newcomen atmospheric engine (see B1) is not normally open at the time of writing.

Z3 SHEFFIELD BUS MUSEUM

Tinsley Tram Sheds, Sheffield Road, Tinsley, Sheffield S9 2FY.

Phone (0114) 255 3010

SK 392903

Open Sat and Sun, 12.00-4.00. Admission charge. Collection of buses and other transport items in old tram depot. See no. M49.

Z4 KELHAM ISLAND MUSEUM

Kelham Island, Sheffield S3 8RY.

Phone (0114) 272 2106

SK 352883

Open Sun 11.00-4.30, Mon-Thurs 10.00-4.00. Admission charge.

Large and varied collection illustrating the city's industrial and social history including cutlery, edge tools, steel, heavy engineering and arms and

armaments. Includes the 12,000 hp River Don Engine (E48), Europe's largest working steam engine. Housed in former tramways generating station, see no. M51. Temporary exhibitions.

Z5 SHEPHERD WHEEL

Whiteley Woods, Hangingwater Road, Sheffield S11 8RT.

Phone via Abbeydale Industrial Hamlet, (0114) 236 7731

SK 317854

Open Wed-Sat 10.00-5.00, Sun 11.00-5.00 (4.30 in winter). Admission free.

Water-powered cutlery grinding wheel, restored to working order. See no. G5.

Z6 SOUTH YORKSHIRE FIRE MUSEUM

West Bar, Sheffield S3 8PT.

Phone (0114) 275 2147

SK 353877

Open Suns 11.00-5.00, and by arrangement for school parties and other groups. Admission charge.

History of fire fighting in South Yorkshire and round the world, preserved fire engines, in combined police/fire station of 1900 (LSII).

Z7 SOUTH YORKSHIRE RAILWAY

Barrow Road, Meadowbank, Sheffield 9

SK 389916

Open Sat and Sun 11.00-4.00. Admission charge. Steam and diesel engines, carriages, wagons, signal box, on short section of former South Yorkshire Railway line from Sheffield to Barnsley, opened 1854.

Z8 TRADITIONAL HERITAGE MUSEUM

605 Ecclesall Road, Hunters Bar, Sheffield S11 8PT.

Phone (0114) 276 8555 ext 6296

SK 334858

Open occasionally as advertised locally, and for parties by arrangement. Admission charge.

Local trades, crafts and occupations, with re-created shops and workshops, in former church hall.

Z9 WORSBOROUGH MILL MUSEUM

Worsborough, Barnsley S70 5LJ.

Phone (01226) 774527

SE 350034.

Open Wed-Sun 9.00-5.00. Admission by donation. Restored water-powered cornmill with interpretative centre; see no. A9. The former steam mill now

houses a rare 1911 Hornsby oil engine from Sykehouse windmill (no. A21).

Z10 WORTLEY TOP FORGE

Thurgoland, Barnsley S30 7DN.

Phone (for party visits) (0114) 288 2649

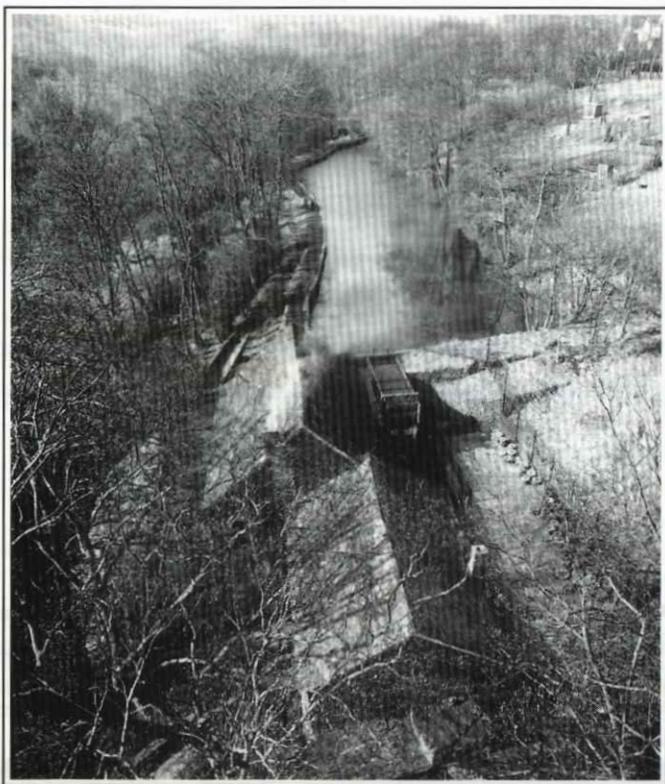
SK 294998

Open Sun 11.00-5.00, and by arrangement for school and other parties. Admission charge.

17thC water powered iron forge, see no. D26, preserved by South Yorkshire Industrial History Society and being restored by South Yorkshire Trades Historical Trust. Three working water wheels, tilt hammers, blacksmith's forge, stationary steam engines and other exhibits. Occasional Steam Days and other special events.

Besides these industrial museums, the museums in Sheffield (City Museum, Weston Park), Rotherham (Clifton Park) and Doncaster (Chequer Road), and those at Bishops House, Meersbrook Park, Sheffield (temporary exhibitions), Cannon Hall, Cawthorne, Barnsley, and Cusworth Hall, Doncaster, contain much of interest about local social and industrial history and the area's products. Cannon Hall was the home of the Spencer family of ironmasters in the 17th and 18thCs.

The Cutlers' Hall, Sheffield (no. G1) has a fine collection of silver and important archives. It is only open to pre-booked parties, but visitors can walk in and view the silver cabinet. Enquiries to The Secretary, Cutlers' Hall, Sheffield S1 1HG, phone (0114) 272 8456.



Z5: Shepherd Wheel

Sheffield City Museums

INDEX

Agricultural tools	49	Fireclay	1, 16, 17	Road transport	3, 68
Alloy steels	3, 31-33	Foods	4, 6	Road vehicles	41
Artificial fibres	55	Forges	5, 19, 23-25, 27, 29, 31, 33, 34, 39, 42, 49, 57, 70	Roads	2, 62
Blacksmiths	23, 25, 70	Forging and rolling	31-34, 38, 39, 50	Rolling mills	5, 21, 23, 24, 29, 33, 34, 38, 39
Breweries	7, 8	Foundries: iron	20-23, 25, 32, 34, 39, 52, 56, 61	Ruddle	16
Bricks	16, 17, 45	Foundries: brass	23, 39	Scissors	41, 42, 44, 47, 49
Building materials	18	Gas	11, 21, 23, 59, 62	Sewerage	59, 61
Canals	2-5, 10, 15, 19, 21, 26, 28-30, 38, 40, 44, 48, 55, 56, 63-65	Glass	2, 17, 18, 27, 31, 49, 69	Ships and boats	2, 32, 40, 64
Cementation process	2, 3, 8, 26, 27	Handles and scales	42, 48, 52	Silverware	2, 7, 39, 42, 45-47
Chemicals	11, 21, 56	Iron	1, 2, 5, 8-11, 19-26, 28, 30-32, 38, 39, 42, 50, 52, 56, 59, 70	Snuff	8
Clothing	55	Iron mining	19, 21	Steam corn mills	5, 6, 34, 41
Coal	1-3, 8-13, 15-17, 19, 21, 23, 29, 38, 39, 56, 59, 64, 66-68	Land drainage	4	Steel	2, 3, 9, 11, 17, 21, 23, 25-34, 38, 44, 45, 47, 49-52, 69
Colliery settlements	14	Lime	15, 20	Stone	1, 2, 15, 18, 20
Corn milling	5, 6, 9, 17, 34, 41, 49, 53, 57, 58	Limestone	1, 5, 9, 15	Tanning	57
Cotton	29, 47, 54, 57	Linen weaving	54	Textiles	53, 54
Crucible steel	2, 3, 26-30, 32, 33, 49, 50, 52, 69	Magnets	34	Timber	6, 8, 9
Cutlery	2, 3, 15, 16, 25-27, 39, 41, 42, 44-49, 51, 56, 57, 69	Maltings	2, 7	Tinplate	21, 25
Edge tools	2, 3, 25-27, 29, 30, 44, 47, 49-52, 69	Museums	5, 6, 17, 21, 29, 31, 34, 41, 44, 49, 52, 65, 68-70	Town trams	3, 15, 39, 40, 63, 67-69
Electricity	3, 32, 58, 59, 60, 66, 69	Nail making	20, 25	Tramroads	19, 21, 65
Engineering	2, 3, 21-22, 26, 29, 31-32, 34, 38-40, 42, 67-69	Paper	29, 44, 57-59	Transport	2, 3, 62-69
Farm engine houses	4	Plumbers' brassware	23	Tuning forks	48
Files	2, 27-30, 33, 39, 50-52	Pottery	17	Upholstery	39, 57
		Printing	54, 58, 69	Vehicle	38, 40, 41
		Railway vehicles	40	Water	2, 55, 59, 60-62
		Railways	2, 3, 7, 10, 13, 15, 17, 19-21, 23, 29, 31, 38, 39, 65-69	Water corn mills	5
		Razors	27, 44, 45, 47	Windmills	5, 6
				Wire	2, 25, 27, 29, 30, 45
				Wire mills	25, 29, 45
				Woodlands	2, 3, 8, 9
				Wool	50, 53, 54
				Wrought iron	21, 23-25, 31

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FURTHER READING

There is a great number of books, booklets and articles about the industrial history of South Yorkshire. This list gives a number of books, mainly recent, which will be useful as an introduction. Local Studies Libraries will be glad to advise on further reading on particular subjects.

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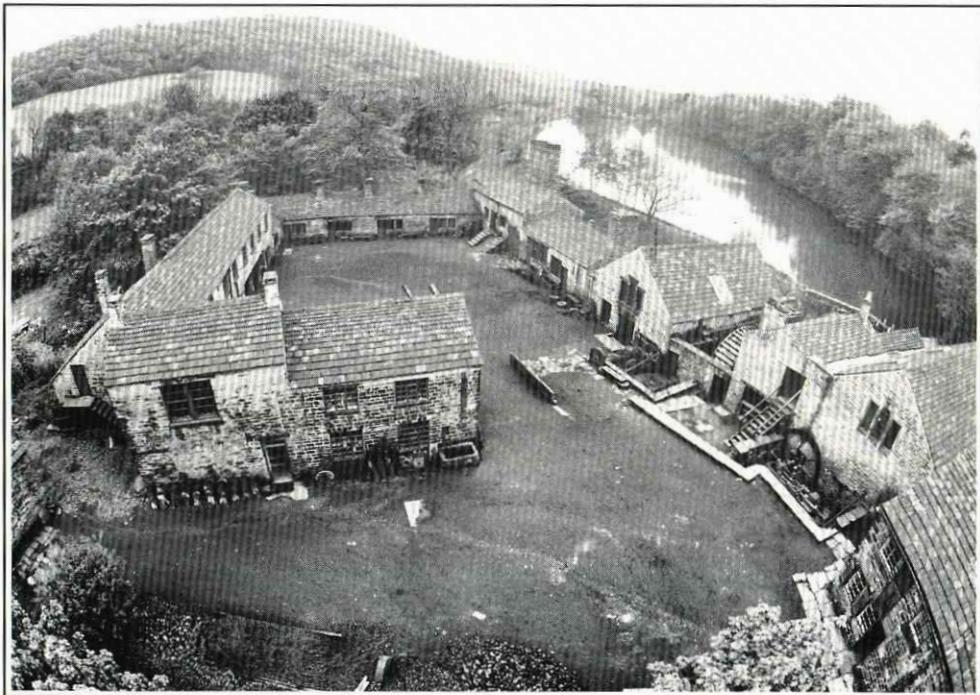
The South Yorkshire Industrial History Society

The Society was set up in 1933 as the Society for the Preservation of Old Sheffield Tools and Machinery. We think it is the world's oldest local society for industrial preservation and industrial history. It played an important part in saving Abbeydale Industrial Hamlet (Z1), helped to save Shepherd Wheel (Z5), and bought Wortley Top Forge (D26) and Rockley Furnace (D11) and Engine House (D2) for preservation.

In 1949 it became the Sheffield Trades Historical Society, and its present name was adopted earlier this year (1995) to reflect its wider interest in all aspects of industrial history in South Yorkshire. It tries to safeguard historic industrial buildings and sites, carries out and encourages research and recording, and supports national bodies like the Association for Industrial Archaeology. It has a programme of talks in Sheffield and Barnsley in the winter and visits in the summer, and publishes an annual magazine, *The Cutting Edge*; an occasional Journal is planned. Some members work as volunteers at Wortley Top Forge. For details of membership please contact the Hon. Treasurer, Mrs P D Lambe, 39 Low Road, Sheffield S6 5FY; and for other enquiries the Hon. Secretary, Mr M H McQuaid, 61 Pingle Road, Sheffield S7 2LL.

The Association for Industrial Archaeology

This book is being published to mark the AIA's 1995 Conference in Sheffield. The AIA was established in 1973 to promote the study of industrial archaeology and encourage improved standards of recording, research, conservation and publication. It aims to support individuals and groups involved in the study and recording of past industrial activity and the preservation of industrial monuments, to represent the interests of industrial archaeology at national level, to hold conferences and seminars, and to publish the results of research. The Association is a voluntary one. It publishes the *Industrial Archaeology Review* which is sent twice yearly to all members, who also receive a quarterly newsletter, *Industrial Archaeology News*. Further details may be obtained from the Membership Secretary, AIA, Dr D Perrett, 33 St Margarets Road, Brockley, London SE4 1YL.



Z1: Abbeydale Industrial Hamlet

Photo: Sheffield City Museums

Association for Industrial Archaeology

AIA



1995

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