A GUIDE TO THE INDUSTRIAL ARCHAEOLOGY OF SOUTH-EAST WALES

A POWERHOUSE OF INDUSTRY

Association for Industrial Archaeology

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This booklet covers that part of south east Wales between the Ogmore and the Wye. The contents, with a few exceptions, have been grouped in to the river valleys that geographically dominate the area. Sites are arranged running up the valleys in geographical order.

The aim has been to convey a representative cross-section of the unique heritage of this area, but constraints of space rule out anything approaching a comprehensive list.

Sites are identified by the initial letter for the valley, followed by a number. A variety of reasons has influenced the selection of sites; some are typical, others are unusual and some simply because they are open to the public or have easy access.

Some sites may not be listed with the accepted present day Welsh spelling but are listed using the name that their owners knew them as.

Against most sites is a symbol denoting access, thus:

✶ Can be viewed from footpath. road, railway or waterway which may pass through or near the site. This should not imply there is permission to wander anywhere at will.

❑ Open to the public, often with visitors' facilities

■ On private land. Seek permission for a visit.

Working site. Permission must be sought for a visit.

Note: the inclusion of sites in the gazetteer should not imply automatic public access. Whenever in doubt, it is always courteous to ask permission to enter a site unless it is clearly open to the public.

This booklet has been published to mark the Annual Conference of the Association for Industrial Archaeology, held in Cardiff, September, 2003.

PUBLISHED BY THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY, 2003

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ABBREVIATIONS

BAC	Brecknock & Abergavenny Canal	MTR	Merthyr Tramroad
BICC	Blaenavon Iron & Coal Co	NA&HR	Newport, Abergavenny & Hereford Rly
B&MR	Brecon & Merthyr Railway	PC&NR	Pontypridd, Caerphilly & Newport Rly
BR	Barry Railway	PD	Powell Duffryn
CR	Cardiff Railway	RT	Rumney Tramroad
DL&PR	Duffryn Llynvi & Porthcawl Railway	RR	Rhymney Railway
GCC	Glamorganshire Canal (Company)	SWMR	South Wales Mineral Railway
GWR	Great Western Railway	SWR	South Wales Railway
LNWR	London & North Western Railway	TICC	Tredegar Iron & Coal Company
McK&H	McKenzie & Holland	TVE	Taff Vale Extension Railway
MCC	Monmouthshire Canal (Company)	TVR	Taff Vale Railway
MR(&CC)	Monmouthshire Railway (& Canal Co)	VNR	Vale of Neath Railway
MT&AR	Merthyr, Tredegar & Abergavenny Rly	VGR	Vale of Glamorgan Railway

COVER ILLUSTRATION: Tremorfa Steelworks, Cardiff, before closure. *TWE*

ISBN 0 9528930 6 1

T45: Cyfarthfa Ironworks

INTRODUCTION

A POWERHOUSE OF INDUSTRY

South-east Wales was one of the powerhouses of the Industrial Revolution. By the mid nineteenth century, if you thought of south Wales you thought of iron and coal, the two fundamental materials of industrialization; and in many parts of the world if iron or coal were mentioned, the words south Wales were often close behind. The Industrial Revolution was built on regional specialisation, sometimes of spectacular intensity (think of the strength of cotton-making in Lancashire, or the outstanding roles of Swansea's copper industry or Sheffield's cutlery trade), and south Wales was one of the archetypal specialised regional economies. By the early nineteenth century it possessed an unparalleled concentration of the largest and most advanced ironworks ever seen. By the early twentieth century it produced one third of all world exports of coal.

These two industrial giants, iron and coal, drove a transformation of the landscape and society of south-east Wales. This was an area of varied territory, stretching from the Bristol Channel and the banks of the Wye to the Glamorgan uplands and the Brecon Beacons, but before the eighteenth and nineteenth centuries almost the whole of it was sparsely populated. The sudden exploitation of the coalfield's mineral wealth turned the region upside down. Development was intensely focused, first upon the ironmaking districts of the outcrop, especially the Heads of the Valleys, then in the central valleys during the steam coal boom. The population grew faster than almost any other part of Britain, with migration from rural Wales, then from further afield. A distinctive working-class society developed, largely Welsh-speaking until the end of the nineteenth century, strong in the values of self-education, chapel culture, and the labour movement. In Wales as a whole, the proportion of the population in industry exceeded that in agriculture by 1841, giving it a claim to be the first industrial nation.

Settlements grew up to house workers and provide for new communities, and to create commercial facilities industry required. Many of the early settlements consisted of just strings of terraces along empty hillsides; but others mushroomed. Merthyr Tydfil grew chaotically into the first

recognisable iron or steel town in the world. The small medieval ports of Cardiff and Newport expanded into vital mercantile centres. Transport infrastructure was revolutionised by canals and horse-drawn tramroads, and later locomotive railways and floating harbours, opening up the isolated uplands to wide markets. A variety of minor industries also operated: the manufacture of Japan ware started in Pontypool, breweries grew up to sate the industrial population, water supply was improved through heroic reservoirs and aqueducts.

All these activities have left their marks on the fabric of south Wales: in the hybrid dialect of the Valleys, in local politics, and in place names, landscape, sites and buildings. As in all areas where once monolithic industries have fragmented, there have been ambivalent attitudes to preservation. The wish to maintain monuments to hard labour, strife and eventual decay as well as technical brilliance or social achievement has been tempered by the instincts of many to turn their backs upon the past. The bitterness of much of the inheritance is unmistakable at the Nantyglo round towers, built so that the ironmasters might escape if their workers turned upon them [EB24]. Much was cleared away in understandable disgust, but attitudes have changed, and the indivisibility of south Wales from its industrial past is now a matter not just for acceptance but for pride. The inscription as a World Heritage Site of the Blaenavon Industrial Landscape in November 2000 crystallised perceptions that the industrial heritage of Wales carried international significance. Nearly all the sites in this guidebook are now officially protected.

IRON, STEEL AND TINPLATE

The iron trade of south-east Wales before the Industrial Revolution was overshadowed by the explosive growth which followed, but charcoal-fuelled blast furnaces and forges located here from the sixteenth century onwards. Iron ore was readily available in the coal measures at the rim of the South Wales and Forest of Dean coalfields. All of the charcoal ironworks were water-powered, single-furnace operations. The best-preserved is the sixteenth-century furnace at Tintern [W8], fully excavated and displayed. Abercarn Furnace [EB14] is remarkably complete.

The early furnaces and forges were distributed widely, the only real cluster being in the Wye Valley, where river navigation allowed connections to the iron trade of the midlands. Most of the earliest sites are fragmentary, but the detective work of searching out remains is fascinating. Near Tintern are Trellech Furnace [W14], hidden deep in Woolpitch Woods, and the romantically-lost forge sites of the Angiddy Valley, where ponds, watercourses, cottages and workers' pathways are circumstantial evidence of heat and noise [W6-10]. Many of the local forges were for the specialist trade of wiremaking, pioneered here in the sixteenth century. The watercourse for Whitebrook wireworks can be followed for a mile [W22].

A burst of new ironworks in south Wales from the 1750s transformed the iron trade of Britain. Vast territories rich in coal, ironstone and lime could be leased by single enterprises, and all the latest methods were applied in a grand, co-ordinated scale. The new generation of works were multi-furnace, coke-fired, mainly steam-powered, usually integrated with puddling furnaces to make wrought iron, and vast in scale. Already by 1803, Cyfarthfa Ironworks was the largest in the world, with 2,000 workers. Six blast furnaces can still be seen, together with the water-power system, tramroads and the former mansion of the Crawshays, now the town museum [T45-50]. Neighbouring Dowlais, the first ironworks in the region to adopt coke fuel, eventually overtook Cyfarthfa, with 6,000 workers: its site is marked by stables, a blowing house and a fine group of public buildings [T52-5]. In 1830, south Wales produced 40% of all British pig iron, and was by far the greatest ironmaking district ever seen. No better place exists for anyone who wants to understand the iron industry of the early nineteenth century. There were some seventy works, mostly of enormous size. The best preserved is Blaenavon [AL25], but outstanding complementary remains can be seen in a southern cluster at Tondu [O8], Llynfi [O9] and Cefn Cribwr [O6], and along the Heads of the Valleys at Gadlys [TC3], Ynysfach [T38] and Sirhowy [S13], among many other sites.

Pig iron and later wrought-iron rails were the mainstays of the trade, but tinplate was an important product. Mechanical rolling of iron plates for tinning was invented at Pontypool in around 1720, and south Wales led the industry for two centuries. Whilst 'Tinopolis' was Llanelli, there were im-

portant works in south-east Wales too, and one of the scant surviving groups of characteristic tinplate buildings is at Treforest [T16].

The invention of the Bessemer converter in 1856 blew open the south Wales iron industry by allowing cheap production of mild steel. Local phosphoric ores could not be used until Gilchrist Thomas's discoveries in 1879, by which time the region had slipped seriously behind. Despite revivals, the old sites on the coalfield were soon finished. New enterprises were opened on the coast, notably the 3-mile long Llanwern Steelworks of the 1950s [MC4].

COAL

Coalmining developed first along the outcrops, supplying the insatiable furnaces with fuel. The two industries were in common ownership, and the same mountain patchworkings often produced both fuel and ore. Levels were driven into the hillsides, and shafts gradually extended from the outcrops. Particular features of the well-drained coalfield rim were balance pits, in which loaded drams were raised by tanks of water – an example of the mechanism is at Big Pit [AL26].

Export of coal began in the late eighteenth century, utilising the transport infrastructure developed for the iron trade, but real growth resulted from the discovery of steam coals deep in the central coalfield, and the increasing global use of steam for power. Great coal combines that emerged, like Ocean and Powell-Duffryn, and the valley names themselves – Rhondda, Cynon, Llynfi – became synonymous with quality, especially after Admiralty tests proved south Wales coal supreme. Improvements made to winding, pumping, ventilation and transport all raised efficiency. A series of giant engines illustrates steam technology in the industry superbly – from beam engines of the 1840s at Newbridge [T18] and Glyn Pits [AL7] to fast-moving horizontal winding engines still intact at Hetty Pit [TR1] and Elliot engine house [RH16].

Groups of pithead buildings evolved from functional clusters to the show-pits of King Coal at his most confident, such as Lewis Merthyr Colliery (now Rhondda Heritage Park - TR3). This is one of astonishingly few sites with the towering pithead gears which remain Welsh icons. Crumlin Navigation [EB15] is the most striking group, with its sparkling use of red and yellow brick on a theatrically sloping site. Penallta [RH15] is the masterpiece of order, built at the Edwardian peak of the industry, when some 250,000 men worked in coal mining: a quarter of the adult male population of Wales. It was planned around a massive terraced yard, with all the engines in a single power hall on the German model. The pithead baths added in 1938 is one of the finest examples of the Modernist architecture of the Miners' Welfare Committee: it served 4,000 men. Big Pit [AL26] and Tower [TC10] reflect more normal practice in the piecemeal accretions of buildings over time, fitting formlessly into awkward, hillside sites. Both include buildings dating from after Nationalization in 1947. Tower remains the last deep mine at work in Wales, but Big Pit, now the national mining museum for Wales, offers visitors the chance to travel down the shaft to underground haulage engines, coal faces, stables, and utter darkness. When you surface you can look across the valley to Pwll-du, where un-restored chasms record the first strip-mining in Britain, introduced in 1943 to aid Wartime production.

U23: Llangattock Wharf *CRW*

U24: Crickhowell Bridge *CRW*

TRANSPORT

The awkward territory of the mineral fields of south-east Wales posed major challenges for entrepreneurs. While the coastwise trade connected several harbours and linked to the Wye Navigation, penetration of the hinterland was arduous. The upland areas were agriculturally poor, and improved turnpike roads arrived late by English standards, mostly following, not leading, industrial demand. Some impressive bridges can be seen. The most justly famous is Edward's Bridge at Pontypridd of 1756, the largest span in western Europe for two generations [T25]. Its graceful rainbow-arc across the Taff is still inspiring; a total contrast with causeway-bridges such as Leckwith [EL3] and Crickhowell [U24]. Two impressive iron road bridges survive on the Wye: Chepstow built in 1816 [W2] and Bigsweir, 1825 [W16]. The newest masterpieces are for motorways: the Wye viaduct and the graceful Second Severn Crossing [MC10].

Canals and horse-drawn tramroads were the joint solution to the transport problems of the Industrial Revolution. Canals were promoted in the 1790s, climbing steeply up strategic valleys: the Glamorganshire Canal from Cardiff and the Monmouthshire from Newport. The flight at Fourteen Locks must have been formidable to work [EB4]. Despite the ravages of valley redevelopment, stretches of the Glamorganshire Canal survive intact [T37, T6], and the water-powered pump at Melingriffith is a remarkable survival [T3]. Holiday boats ply the Brecknock and Abergavenny, which loops around the east side of the coalfield, passing wharves and warehouses where iron, coal and lime were loaded [U5, 11, 16, 19]. Horse-drawn tramroads climbed into the hills or supplied the ironworks with materials. South-east Wales probably possessed the densest tramroad networks ever built – those linked to the Brecknock and Abergavenny Canal are featured on page 38. Gradually, some began to serve the same arterial functions as canals. The Merthyr Tramroad paralleled the congested Glamorganshire Canal, and its stone sleeper blocks can still be followed through the woods above the Taff [T35]. Famously, it was on this line in 1803 that Trevithick operated the first steam locomotive to haul a load. Among other notable tramroad features are Pwll-du tunnel at Blaenavon [AL31], Bassaleg Viaduct [EB2], Robertstown bridge [TC4], and Pontycafnau, built around 1792 and probably the first railway bridge ever built in iron [T48].

The locomotive railway arrived with the Taff Vale in 1841, from Cardiff to Merthyr. Brunel's South Wales Railway gave a connection to London in 1852, via Gloucester, until completion of the Severn Tunnel in 1886 [MC9]. A ramifying network of other railways eventually connected every valley, every pit. The most significant features were the viaducts that crossed the coalfield's deep grain, such as the Cefn Viaduct at Merthyr [T59] and the prodigious Crumlin Viaduct, sadly represented only by its abutments, clinging 200 feet above the valley floor [EB16].

Rail wagons by their thousands trundled day and night to Newport, Cardiff, Penarth, Barry and Porthcawl. Cardiff and Newport were the oldest ports, and grew with the iron trade from the late eighteenth century; but it was the coal trade which created spiralling growth. Cardiff built the first floating dock in Wales in 1839, and a series of large docks followed. In 1890, they handled as much by weight as London. Although the port has changed out of recognition, many features remain, from the Pierhead offices to graving docks and signal platforms [CF2-15]. The trading offices of Mountstuart Square symbolise Cardiff's success: the Coal Exchange here set prices internationally. Barry was created to break Cardiff's monopoly [GC3]. The harbour and a new railway to the Rhondda were built in 1889, and coal was immediately re-routed there in quantity: in 1913 Barry created a world record for coal shipments which will now never be exceeded. Most surreal of all the features of the south-east Wales ports is Arnodin's Transporter Bridge at Newport, on which you float above the mudbanks of the Usk, borne in a stylish gondola [NP2].

MISCELLANEOUS INDUSTRIES

South-east Wales did not have a diverse economy historically, though this has changed in recent years. This gazetteer highlights many of the lesser trades, together with a few engaging oddities. Among significant early industries were the copper works at Redbrook on the Wye [W27], and the chain of eighteenth-century paper mills a stone's throw away in the Whitebrook Valley [W22-3]. Remarkable enterprises include the 1850s cement works at Aberthaw, which capitalised on the

hydraulic qualities of local lime [GC7], the china works at Nantgarw, which made decorated wares of international repute from 1816 [T14], and the Welsh Hills Works mineral water works, now a centre for rock music appropriately called 'The Pop Factory' [TR4].

Bricks were made for building and for refractories – most ironworks had several kilns constantly working to re-line the furnaces. Lime was quarried in the Carboniferous outcrops along the rim of the coalfield, and was used in vast quantities as flux in the blast furnaces: majestic quarries can be seen at Morlais [T58] and Llangattock [U22], among other places. Rural limekilns to make mortar and sweeten the land survive on many harbours and canal banks. Of the numerous schemes to supply the burgeoning population, the string of Taff Fawr reservoirs in the Brecon Beacons are prime examples [T63].

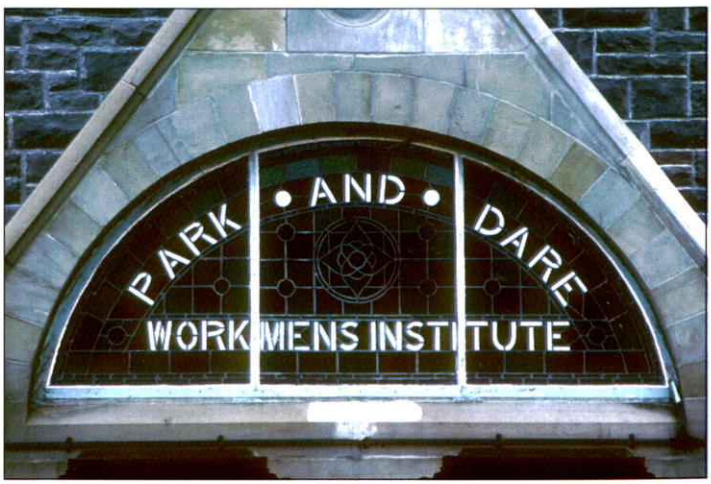
A few sites stand out from relatively modern industries. Treforest Trading Estate [T15], laid-out in 1936, was the first industrial estate in Wales, offering standard units and centralised services to manufacturers of everything from gloves to zips to chemicals to sparkplugs. Some notable architects designed arresting industrial buildings in the twentieth century. Sir Percy Thomas modelled British Nylon Spinners at Pontypool in 1947 [AL3], and Richard Rogers characteristically turned the INMOS semiconductor plant structurally inside-out in 1982 [NP18].

SETTLEMENTS AND LANDSCAPES

Much of the earliest industrial housing has long gone, but key workers' houses survive at Blaenavon Ironworks and nearby Cwmavon [AL21, 25]. Visitors to Chapel Row at Merthyr can visit a typical ironworkers' house, home of the composer Joseph Parry [T43]. However, the most engaging place of all to see interiors is the Museum of Welsh Life, St Fagans [CF23], where a row of houses from Rhydycar has been re-erected. Each is furnished to a different date, illustrating the shifting material culture of working communities, from the vernacular to MFI. Company houses like these were planted wherever staff were needed, but they were eventually superseded by a boom in speculative building of terraces which filled every valley in the coalfield.

The chaotic growth of most settlements contrasts with a few planned communities. The finest is Butetown near Rhymney, laid out as a Palladian set-piece in 1802-4, where one of the houses is a museum [RH17]; but elements can be detected in the squares of Abercanaid and the circle-plan around Tredegar's iron clock, heart-rendingly contrasted with the hill-top cemetery for inhabitants mown down by the cholera epidemics to which new industrial towns were vulnerable [S10, 12]. A more optimistic age is heralded by several garden suburbs: Rhiwbina Garden Village, set out in 1912 [CF24], and specifically for industrial workers, Pontywaun [EB12].

The larger towns should not be neglected as places to learn about industrial society. The Victorian



TR7: The Park and Dare Institute *see p 21* *TWE*

Abertillery *TWE*

boom town Cardiff shows the growth of arcades, banks, markets and department stores, wealthy suburbs, and miles of terraces. Hardly anything in Cardiff dates from before the mid-nineteenth century. Newport is, in contrast, a town with a significant Georgian core, but most of the valleys centres, like Pontypridd, Maesteg and Pontypool, tell a tale of astonishingly fast creation in the nineteenth century.

Beyond individual monuments, you must comprehend the landscape. If you want to understand the massive organisation of resources by the early iron industry, you must wander over the territories that the iron companies controlled. Follow the oblique street-lines of Hirwaun and you begin to understand how the town grew up on horse-drawn tramroads [TC8-9]; treck across the mountain-top above Blaenavon to see the way that iron ore was scoured from the surface [AL24]; explore Merthyr's public buildings, fruits of a vibrant nineteenth-century society.

If you visit Rhondda Heritage Park you see important structures, but follow the Rhondda Fawr or the Rhondda Fach upstream and you encounter whole landscapes which, despite the loss of many features, still tell the story of how the tide of industry swept up into the coalfield, bringing collieries, tips, chapels, miners' institutes, hotels, railways, Italian cafes, and terraced houses by the thousand. The cosmopolitanism of the 'coal-rush' frontier is suddenly apparent. The facilities communities provided for themselves, usually by subscription, are astonishing: the Parc and Dare Institute at Treorchy seats 2,200, more than many West.End theatres [TR7]. Some 100 institutes like this were created in the coal boom years.

Millions of lives went into the creation of the industrial culture of south Wales. The landscapes, sites and buildings in this gazetteer are monuments to all of them.Millions of lives went into the creation of the industrial culture of south Wales. The landscapes, sites and buildings in this gazetteer are monuments to all of them.

Dr Peter Wakelin

The earliest signs of industrial activity in Cardiff would appear to be finds of charcoal and iron slag in the Roman fort on the site of what is now Cardiff Castle. However, it is the wealth brought to Cardiff in the nineteenth century by the coal and iron trade which is still apparent amongst the new developments in what is now called Cardiff Bay. The Pierhead Building and the Coal Exchange vie with each other as the grandest and most eloquent displays of the days when Cardiff was the greatest coal-exporting port in the world.

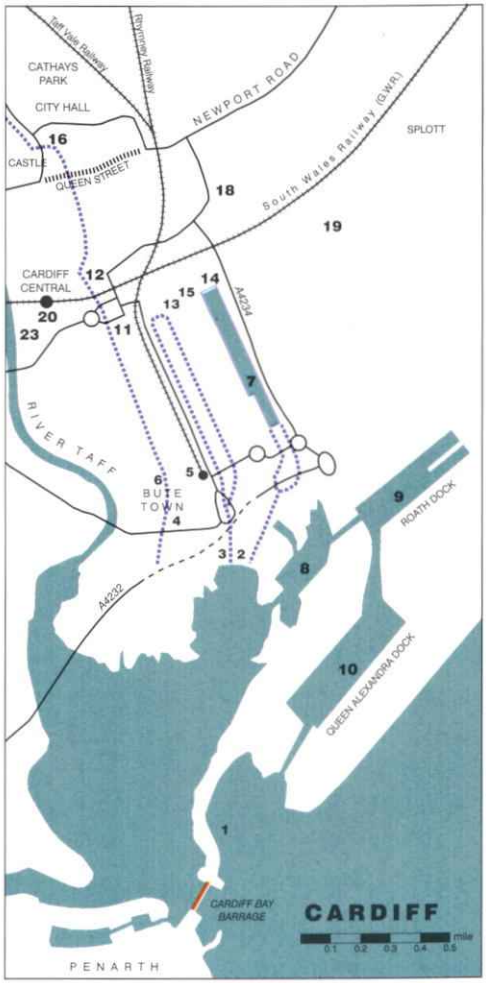
The Glamorganshire Canal opened fully in 1798 but remains are now scant, being little more than a green park between the city centre and the now enclosed bay. To meet the demand for shipping facilities Lord Bute built what became the Bute West Dock at a cost of £350,000, opening in 1839 and enclosing 19 acres of water. This too has been filled in and is now built on although a few warehouses remain. The entrance basin is now the Roald Dahl Plasse and a public space. The Taff Vale Railway opened from Cardiff Docks in 1840 and in 1858 the Rhymney Railway reached the **Bute East Dock [CF7]**. The dock opened fully in 1859 and eventually enclosed 45 acres. Much of this survives as an isolated stretch of water, with the listed **Bute Warehouse [CF14]** at its north end. All other buildings fronting on the dock are modern, despite appearances.

The docks continued expanding with the **Roath Basin [CF8]**, **Roath Dock [CF9]** in 1887 and finally the **Queen Alexandra Dock [CF10]** twenty years later. These parts of the dock are still in use commercially and the dock structures themselves are the most important historic features.

In 1888 the docks were transferred from the Bute Estate to the Bute Dock Co. and then, in 1897 to the Cardiff Railway Co. A result of this was the superb **Pierhead Building [CF2]** (1896), alongside the **West Dock Basin [CF3]**, which housed the dock offices. One of the former iron-framed transit sheds is now re-sited, mounted on stilts and is occupied by a Turkish restaurant and another is a craft centre on a traffic roundabout. Also on the waterfront can be seen a number of graving docks.

To the west of the pierhead is Mountstuart Square where shipping and coal companies had their offices. Much has been demolished but some of the old grandeur can be sensed. The centre of the square is occupied by the **Coal Exchange [CF4]**, now used for functions, but its trading floor remains. In this area are the Custom House (one of several of different periods, this one moved from its original location), Pilotage Building, a hydraulic accumulator station, graving docks and the Norwegian Church (a complete rebuild in wood of the church which stood within the docks).

The strip of land between the length of the Glamorgan Canal Sea Lock pound and Bute Road



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was laid out as housing for 'white collar' dock workers and management by the Bute estate in the 1850s. By the twentieth century the fabric had deteriorated and the area had become populated by dockers and seamen's families from throughout the world, popularly known as 'Tiger Bay'. In the 1960s the City Council cleared the whole area but retained the Butetown community in temporary accommodation while new housing was built for them on much the same grid plan and retaining the Bute-inspired street names.

Some original housing survives south of James Street, notably Windsor Esplanade (Rat Island) now overlooking the unchanging waterline of the newly-styled 'Cardiff Bay'.

CF1 CARDIFF BAY BARRAGE

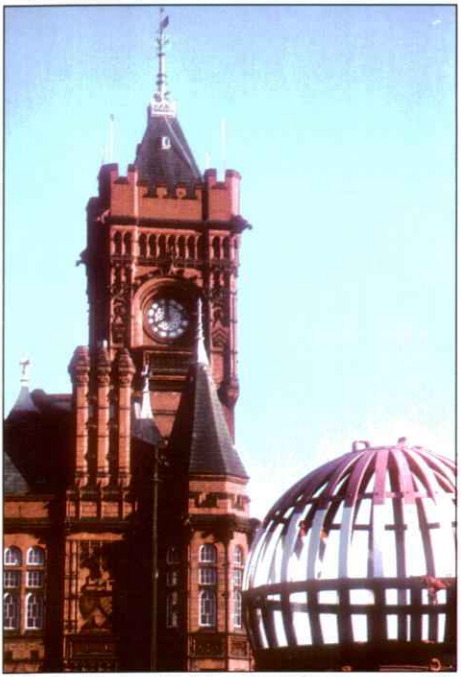
ST 194735 to ST 189724 ❑

Measuring 1.1km (1,210 yards) in length, the barrage was designed as part of the creation of a new waterfront for Cardiff. Completed 1999 and resulting in a 5,000 acre freshwater lake from the impounded Taff and Ely rivers, it has 'eliminated the effect of the tide' - apparently an inhibitor to development. Very controversial, not least amongst the thousands of birds evicted from the now covered mud-flats.

CF2 PIERHEAD BUILDING

ST 193745 ❑

Alongside the West Dock Basin is the magnificent Pierhead Building erected in 1896 as dock offices for the Bute Dock Company. Note the fine terracotta panel on the west face. Now occupied by the National Assembly Government of Wales and at present open to the public.



CF2: The Pierhead Building, Cardiff Docks *TWE*

CF3 WEST DOCK BASIN

ST 192745 ❑

The former entrance basin to the Bute West Dock, opened 1839, now filled in and decked as a public open space and named to disguise its origin the Roald Dahl Plasse. The massive stone walling at least is clear. For twenty years until the late 1990s this housed the tug *Sea Alarm*. It was cut up in place when the Welsh Industrial & Maritime Museum was closed down as being an undesirable element of the regeneration of Cardiff's dockland. Mermaid Quay festival shopping centre now stands on the site of the WIMM Hall of Power.

CF4 COAL EXCHANGE, MOUNTSTUART SQUARE

ST 189747 ✶

A fine building occupying the centre of Mountstuart Square constructed 1883-6. The Coal and Shipping Hall was rebuilt in 1911 and this magnificent hall, with its Corinthian columns, oak balcony and rich wood panelling, is now used for functions and broadcasts. In the entrance hall two lion statues support dials giving the tide times.

CF5 BUTE ROAD STATION

ST 191749 ✶

A listed three-storey stuccoed building with hipped roof. Built in 1843 as the headquarters of the TVR, the board room survives on the upper floors. It has had a number of uses, including housing galleries of the former WIMM but has recently been sold.

CF6 GLAMORGANSHIRE CANAL SEA LOCK POUND

ST 187744 to ST 185758 ❑

Cardiff's first floating harbour, opened in 1794 to the ballast bank on the river (ST 187750) but extended in 1798 to the sea lock. Closed since 1951, now largely laid out as parkland. Sea lock obliterated by the western entrance to the Butetown road tunnel but some of the granite stones from the entrance retained and unsympathetically re-erected with a fanciful flimsy wooden lock gate on a roundabout a mile away at ST 197748. Some bollards and the base of a crane remain near ST 188747 and the site of James Street swing bridge (ST 188746) is commemorated by some artwork.

The wharf connecting lines of the canal company's own railway and the GWR's Clarence Road branch can be made out in places but best survivor is the still functioning Lloyds Beal chain and anchor testing house on Dumballs Road (ST 185753). An 1866 testing machine, used until 1983, is preserved on a plinth at the entrance.

CF7 BUTE EAST DOCK

ST 194754 ❑

Now an isolated stretch of water over half a mile long, this was the second dock opened by Lord Bute, in stages from 1855 to 1859. 45 acres of water were enclosed and fifteen coal staiths erected, allowing 1 million tons of coal a year to be handled at this dock alone. By 1890 there were 30 staiths, plus three ballast cranes and 22 hydraulic cranes. The only original building fronting the dock to survive is the Bute Warehouse. The basin and entrance to the dock has been filled in and a crane relocated cosmetically on the east side.

CF8 ROATH BASIN

ST 196244 ✶

Opened 1874 enclosing 12 acres, with a couple of graving docks off. Not now used commercially but accessible to the public. Now home to the former Helswick lightship.

CF9 ROATH DOCK

ST 202748 ■

Reached via the Roath Basin, opened 1887. 33 acres of water still in commercial use and not accessible.

CF10 QUEEN ALEXANDRA DOCK

ST 200740 ■

The final expansion of Cardiff Docks, opening in 1907, covering 52 acres. The main commercial section of the docks with direct locked access to the sea outside of the Barrage. The link to Roath Dock is spanned by a 1904 swing bridge built by Handyside. A few buildings remain; a pumping station and a length of transit sheds from the 1930s.

CF11 JUNCTION CANAL RAILWAY BRIDGE

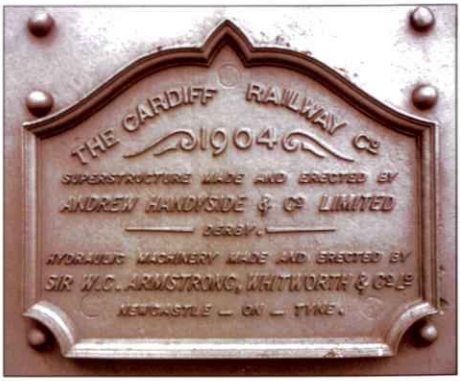
ST 186756 ❑

The junction canal linked the GCC with the Bute West dock being bridged by the canal towpath, Bute Road and the TVR Docks branch. The stone arched railway bridge survives. The junction canal allowed passage of timber and coal and patent fuel boats between canal and docks.

CF12 CUSTOM HOUSE

ST 184758 ✶

Marks where the Sea Lock pound of the GC gave way to the narrow canal. Only the exterior walls remain of a completely gutted and refurbished 1845 building now housing the Welsh Rugby Union.



CF9: Roath Dock *MJM*

CF13 SPILLERS & BAKERS WAREHOUSE

ST 191758 ✶

Built 1893 by corn and flour merchants as part of a complex of steam roller mills processing 100,000 tons of wheat a year. Unusual in its curving north face, which followed the line of a siding, it is now converted to flats.

CF14 BUTE WAREHOUSE

ST 192759 ✶

At the head of the Bute East Dock, the listed 1861 warehouse is also known as the Bonded Warehouse. Stands on cast iron Doric columns. Now occupied by a firm of architects, it has gained a number of additions. The 'warehouse' accommodation surrounding the rest of the dock is modern and replaces the coal hoists and cranes.

CF15 LNWR WAREHOUSE

ST 190759 ✶

Currently known as the Hanover International Hotel this former railway warehouse of about 1900 retains many original features both internally and externally, including vaulted fireproof ceilings supported on cast iron columns.

CF15: LNWR Warehouse *TWE*

CF16 NORTH ROAD CANAL BRIDGE

ST 183766 ❑

Now a pedestrian subway beneath Kingsway but with lines of the original canal masonry and an iron rubbing post visible.

CF17 MAINDY WEIR AND BUTE DOCK FEEDER

ST 171781 to ST 188758 ❑

Surveyed by James Green in 1828 but not built until late 1830s to supply water from river Taff to the first Bute (West) dock. Feeder survives to now feed the remaining second (East) dock and the Roath Dock. Can be walked from the weir to where it passed beneath the GCC at ST 182767 and thence around the town. It is culverted from the New Theatre and beneath Churchill Way.

CF18 ADAMSDOWN CEMETERY

ST 193766 ❑

Small former nineteenth century municipal cemetery, closed 1877 and now an open play space but with the gravestones lying against the perimeter walls. Many record deaths of seamen in the Bute Docks.

CF19 CARDIFF MALTINGS, EAST TYNDALL STREET

ST 200762 ✶

A little way from the main docks area this fine range of malting buildings originally dates from 1887 and is now in use as light industrial and commercial units.

CF20 CARDIFF CENTRAL RAILWAY STATION

ST 186757 ❑

Designed by GWR Architects Department and built 1932-34 under the Unemployment Relief Scheme. Portland stone booking-hall, with clock cupola and recently re-installed Art Deco lighting.Platform blocks are cream-glazed (Doulton), and the canopies are contemporary. To assimilate TVR and BR traffic the layout and signalling were also altered.

CF21 BRAIN'S BREWERY

ST 182756 ■ ☍

Site taken over by Hancock's in 1894 and subsequently became part of Bass. Bought by Brains in recent years and all production transferred here. Brains Old Brewery in St Mary Street, dating from 1713 and acquired by Brains in 1882 now being redeveloped as a retail site.

CF22 FERRY ROAD GASHOLDER

ST 174743 ✶

Plated cylindrical gas-holder of 1881 supported by a double tier of 16 cast-iron Doric columns.

CF23 MUSEUM OF WELSH LIFE, ST FAGANS

ST 117772 ❑

Set in 100 acres of parkland in the grounds of St Fagans Castle, a late 16th century manor house, the Welsh Folk Museum was opened in 1948 and was a pioneer open air museum. There are a number of galleries in the main museum buildings and exhibits in the castle itself. The open-air section now has over 40 original buildings moved from various parts of Wales and carefully re-erected. A number are of particular industrial interest:

Melin Bompren Corn Mill, Oakdale Workmen's Institute, Sawmill, Rhaeadr Tannery, Llawr-y-glyn smithy, Rhyd-y-car houses, Gorse Mill, Tollhouse, Esgair-Moel Woollen Mill.

CF24 RHIWBINA GARDEN VILLAGE

ST 158812 ✶

Inspired by the late 19th century Garden City Movement, Rhiwbina Garden Village Society was formed in 1912 acquiring 107 acres north of the city, adjacent to the recently opened Cardiff Railway. The first 34 houses were built in 1914 and development continued through the 1920s. 189 houses were built in all and in 1968 the leaseholds were sold to the remaining tenants. The village is now a conservation area and retains a distinctive character.

CF24: Rhiwbina Garden Village SR

T3: Melingriffith Pump *TWE*

T1 LLANDAFF WEIR AND MILL FEEDER

ST 153785 to ST 158780 ❑

Feeder can be followed below cathedral city of Llandaff and through cemetery to site of the cornmill, demolished in 1930s during the building of Western Avenue. The tailrace flows through Llandaff Fields and Pontcanna where it also powered a fulling mill.

T2 RADYR QUARRY

ST 140795

This quarry the source of the capping stones for many TVR bridges. Served by a siding from the Penarth line. Although not very durable, the attractive red sandstone breccia was much used locally as a domestic building stone (see for example the canal-side settlement of Llandaff Yard ST 153787). Other quarries for this stone were on the right bank of the river Ely at Leckwith and Cogan where they were also associated with clay pits and brickworks.

T3 MELINGRIFFITH PUMP

ST 142799 ✶

Designed by Cyfarthfa engineer, Watkin George, installed 1793 to return precious water to the canal from tinplate works tailrace. Although John Rennie proposed replacing it with a 'fire engine' in 1806 the Melingriffith company would not contribute to the cost. There is no proof that what remains is not George's original design but it is generally believed to be a Rennie replacement. Renovated by IWA and OHIAS in 1980s, and now in the care of Cardiff City Council, but deteriorating.

T2: Radyr Quarry Signalbox and TVR milepost *TWE*

T8: Walnut Tree Viaduct
TWE

T4 RADYR WEIR AND MELINGRIFFITH FEEDER

ST 131808 - ST 141798 ❑

Built c1750 to provide water power for the Melingriffith tinplate works. Remains of a boat lock at the river end (partially covered by the Taff trail cycle path) which enabled the movement of iron to Melingriffith from the upstream Pentyrch furnaces. When the tinplate works were demolished and replaced by a housing estate in the late 1980s, the feeder was perpetuated by the WDA to allow eventual future operation of the preserved Melingriffith pump.

T5 MELINGRIFFITH - PENTYRCH RAILWAY

ST 143803 - ST 120833 ❑

Authorised as a tramroad in 1812 to connect the Pentyrch ironworks and the Melingriffith tinplate works. Converted 1871 to a railway and extended northwards to a junction with the TVR at ST 117843. Track can be walked today. Number of discarded stone sleeper blocks on river bank. Iron girder bridge crossing river Taff to 16th century Cilynys farm. Crosses TVR on the level near to surviving original TVR Pentyrch railway station building of 1841.

T6 FOREST FARM NATURE RESERVE

ST 144804 to ST 13126813 ❑

The GCC in water from Melingriffith to Tongwynlais. Cast iron towpath roving bridge dated 1849 now re-sited at pump. Cast iron towpath bridge dated 1851 across overflow weir into Melingriffith feeder. Remains of Forest lock and Middle lock. Cardiff Railway cutting and stone abutments and pier of railway bridge over canal.

T7 LITTLE GARTH IRON ORE MINES AND LIMESTONE QUARRIES

ST 118825 ■ ⚙

Shafts into Little Garth haematite mines adjacent to dolomite quarries. In 1840 an adit was driven from ST 116827 into the giant cavern of ore. In Fforest Fawr, on the opposite side of the Taff Gap at ST 134833 are abandoned exploratory iron ore workings of the 1830s. These quarries lie on a line of limestone which continues north-east through Cefn On to the massive Machen quarry [RH3] and south-west to Creigiau quarry and the haematite mines at Llanharry.

T8 WALNUT TREE VIADUCT AND TUNNEL

ST 127828 ✶

Solitary remaining brick pier of the 1900 BR lattice girder viaduct since become a monument to the silver then golden wedding of Queen Elizabeth II. The viaduct carried the BR line from the Rhymney valley to Barry Docks.

T9 RHYMNEY RAILWAY WALNUT TREE ENGINE SHED

ST 126833 ✶

From the RR's opening in 1858 it had a junction with the TVR at Walnut Tree from which it had running powers to Cardiff. It was not until 1871 that it had its own direct route to Cardiff via Caerphilly tunnel. The original small engine shed survives near to present day Taffs Well station (the TVR's former Walnut Tree station).

T10 COAL LEVELS ON THE GARTH

ST 1183 ❑

Levels on the southern outcrop and inclines to the valley floor at Gwaelod y Garth associated with the Pentyrch ironworks and Melingriffith tinplate works. Remains of a possible horse gin on mountainside. The 1872 Llan drift (entrance at ST 117834) was last to operate in 1915.

T11 TAFFS WELL LOCK AND LOCK HOUSE

ST 122839 ✶

Typical GCC lock house and outbuildings of 1826.

T12 TAFFS WELL AND TAFFS WELL 1841 STATION

ST 119837 and ST 119839 ✶

The ancient riverside spa survives next to the bowling green, near the site of the Pentyrch weir and the Taffs Well Ferry to Gwaelod y Garth. Below the road overbridge is the original TVR 1841 station building for Taffs Well.

T13 RHYD YR HELIG COLLIERY

ST 110856 ■

Stone and brick 1860s foundations at pithead of one of Melingriffith's collieries.

T14 NANTGARW POTTERY

ST 121855 ❑

On bank of GCC, Billingsley's pottery of 1816 where the finest soft paste porcelain was manufactured for a few years. Later operated by generations of Pardoes making clay pipes and earthenware pottery. Three kilns, one newly constructed by a trust who are now custodians of site. Canalside warehouses opposite converted to dwellings.

T15 TREFOREST TRADING ESTATE

ST 112858 ✶

The first Government owned industrial estate constructed in Wales, 1937 to provide an initial 770,000 sq ft of advance factory space for 3,800 employees in light and semi-luxury industries. By the outbreak of war in 1939 88 tenants were in occupation when the majority of factories were requisitioned for war production. A peak of 16,000 employees was reached in 1944. Several original factories survive but the estate is now privately owned. Railway connection with girder river bridge at ST 107864.

The BOAC engine testing factory was moved to Treforest from Walsall airport in 1940-1, the main plant being built above the estate on the road to Caerphilly (ST 130859). It survives under GE.

T16 TREFOREST TINPLATE WORKS

ST 087880 ✶

Extensive remains of William and Francis Crawshay's 1830s tinplate works. Typical architecture of the Crawshay empire displayed in the circular ventilation windows of the stone-built rolling mill and tinning house. The important iron framed open smithy is now unique to south Wales. The truncated stacks from the tinning bays characterise the tinning process. Part is private and overlaid by a scrapyard and the rest awaiting development proposals.

T17 TREFOREST WEIR AND FEEDER

ST 084889 to ST 087877 ❑

The feeder and tramroad route to the tinplate works passes early nineteenth century workers housing in Treforest. Cardiff Railway of 1907 necessitated a wide tunnel for the feeder to pass beneath the CR embankment which held sidings intended to hold coal trains received from a junction with the TVR. The junction was never approved.

T18 VARTEG BEAM ENGINE, NEWBRIDGE

ST 083886 ✶

Beam winding engine from Newbridge colliery now preserved outside University of Glamorgan (the former School of Mining). Built 1845 by Varteg ironworks it has a replacement cylinder of 1861 by Brown Lenox of Pontypridd.

Deep Navigation Colliery *TWE*

T19 MACHINE BRIDGE, TREFOREST

ST 084893 ❑

Stone solid three-arched bridge built 1809 to carry Doctor Griffiths tramroad from collieries in lower Rhondda to the Doctor's canal at Glyntaff. Widened in 1913 with reinforced concrete roadway.

T20 BRYNTAIL COLLIERY INCLINE

ST 093897 to ST 089893 ✶

Part of the tramroad of 1857 from Bryntail level to the canal. The steep line passes alongside several flagstone quarries.

T21 PONTYPRIDD RAILWAY STATION

ST 072898 ❑

1906-07 rebuild for TVR. Massive red-brick and glazed-tile island platform with bays. Heavy steel and wrought-iron details. Was longest platform on former Western Region of British Railways. In 1906 up to 200 trains per day passed through here.

T22 NIGHTINGALE BUSH NATURE RESERVE AND BROWN LENOX CHAIN WORKS

ST 082898 to ST 080900 ❑

A section of the GCC partly in water. Tunnel beneath turnpike road from Pennant sandstone quarry to canal wharf. Entrance to lower basin of Brown Lenox chain and anchor works of 1816 where, as well as for other later famous liners and warships, the chains for Brunel's Great Eastern and the QE2 were manufactured. Chain Works Chapel of 1873 on the old turnpike road opposite the works entrance. Ynysangharad double lock staircase and lock tail bridge. Bunch of Grapes canalside pub. Little remains of the original chain works, most of the site being occupied by DIY stores.

T23 PONTYPRIDD SIGNAL BOX

ST 070901 ✶

TVR 1902 by McK&H, now an unmanned satellite signalling site. Was of 70 levers.

T24 PONTYPRIDD VIADUCTS

ST 071900 ✶

The first TVR Rhondda crossing of 1841 was single-track narrow-gauge on Brunel's 110ft skew single-span stone arch. Doubling took place from 1857 but with two-spans and a river pier. The sharp leftwards curve into the Rhondda valley from the Taff valley route caused a number of derailments. This caused a second 7-arch double-track crossing to be built in 1861-2. At the north end a cutting of 1872 allowed direct traffic between the two valleys. This route is now filled in.

T25 WILLIAM EDWARD'S PONTYPRIDD BRIDGE

ST 074904 ❑

A spectacularly graceful span of 140ft, spoilt by the 1857 road bridge alongside. When completed in 1756 this was the largest single arched bridge known. Pontypridd museum, with much of industrial interest, is based in the 1861 Tabernacl chapel at the western end of the bridge.

T26 DOCTOR'S TRAMROAD AND LAN COLLIERY

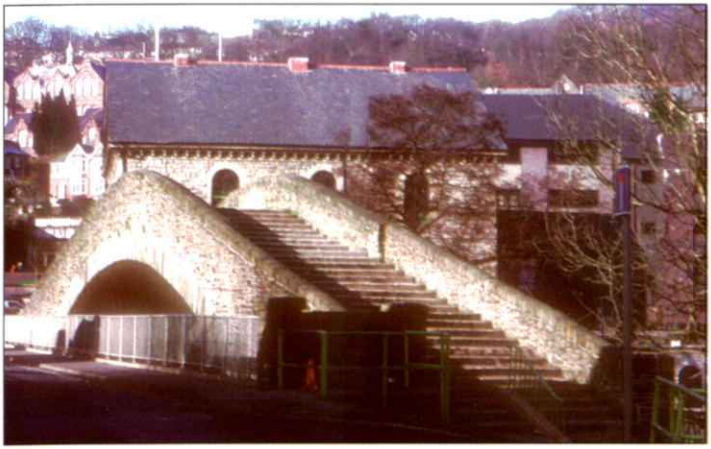
ST 052905 ❑

Stretch of tramroad passes 1860s level entrance to Lan colliery beneath the later BR embankment.

T27 BERW BRIDGES

ST 077912 ❑

Three contrasting bridges spanning the river Taff from the Ynysybwl road. Three stone piers of the 1813 wooden Berw aqueduct which supplied



T25: Pontypridd Bridge *TWE*

water to Brown Lenox and the canal. Surviving three span wrought iron girder bridge on slender Pennant sandstone piers which carried the 1885 TVR branch to Albion colliery Cilfynydd. Early 1900s single span reinforced concrete road bridge.

T28 NAVIGATION HOUSE, ABERCYNON

ST 085948 ✶

Built for the GCC by its engineer/contractor Thomas Dadford Snr in 1791 this was the canal company's headquarters until the early 1880s when they transferred to the Marquess of Bute's Cardiff offices. Now a public house.

T29 THE BASIN, NAVIGATION

ST 086949 ✶

Several scattered houses remain of the settlement formed from 1802 where the Merthyr Tramroad terminated on the GCC. Here too the lower feeder entered the canal. There is a monument to Richard Trevithick next to the fire station.

T30 THE AQUEDUCT

ST 085949 ✶

The road into Abercynon is carried across the Taff on the original canal aqueduct.

T31 WEIR, AQUEDUCT AND LOWER CANAL FEEDER

ST 094957 to ST 086949 ❑

This feeder dates from the beginning of the canal. It crosses the river at ST 093955.

T32 UPPER CANAL FEEDER

ST 097965 to ST 086952 ❑

Dating from 1799, the river weir at the confluence of the Taff and the Bargoed Taff is gone but the feeder can be followed from ST 095964, where it was crossed by the MTR, to where it was intersected by the TVR just before it entered the Abercynon flight of locks.

T33 ABERCYNON FLIGHT

ST 086950 to ST 087956 ❑

The canal rose 207ft in one mile through a series of 16 locks from the aqueduct to Cefn Glas. The remains of the lower eleven can be walked before the route of the A470 cuts into the canal. Aberdare Canal junction of 1812 at ST 086954.

T34 LLANFABON TRAMROAD

ST 086949 to ST 094955 ❑

Sir William Smith's Tramroad of 1810 to bring coal from Gelligaer and Llancaiach area to the canal. Route can be followed from the Basin to Fiddler's Elbow where from 1864 the road adopted the rest of the route to Nelson. The higher lines are those of the TVR branches to Nelson and include the remains of rope-worked inclines.

T35 MERTHYR TRAMROAD TO MOUNTPLEASANT ❑

The MTR ran from Morlais Quarries to Navigation (Abercynon) past junctions with tramroads from Dowlais, Penydarren and Plymouth ironworks. It was built as being more convenient for these three ironworks than the upper section of the GC. It also allowed Plymouth to use Morlais limestone rather than the more expensive Gurnos limestone. Engineered to 4 ft 2 in gauge by George Overton in 1802 it can be walked from the Basin, past Quaker's Yard and Edwardsville and through Brunel's TVR viaduct, past Pontygwaith to where it was intersected by the TVR at Mountpleasant (ST 077986). The MTR crosses the river twice by fine stone arches (ST 095963 and ST 090966) which replaced earlier wooden bridges following the collapse of the lower (Victoria) bridge under a train of drams. The stone cutwaters of the earlier Victoria bridge can be seen when the river is low. In Quaker's Yard a building where the road to Cefn Glas crossed the tramroad is reputed to be a tollhouse. Fine stone high overbridge at Pontygwaith (ST 080976) carrying the road leading to the 1811 steep single span river bridge (repaired in 1993). Where the tramroad route has not been metalled near Pontygwaith, stone sleeper blocks (including passing places), embankments and revetements are in good condition.

T36 CEFN GLAS COLLIERY AND TVE RAILWAY TUNNEL

ST 079968 ❑

A short stretch of the canal escaped the building of the A470 between the Prince Llewelyn (now an enlarged private house) and Pontydderwen canal bridge (standing). Here the Cefn Glas overflow weir and the remains of Cefn Glas colliery can be studied along with the tunnel taking the Taff Vale Extension railway through to the Cynon valley.

T37 GLAMORGANSHIRE CANAL, ABERFAN TO MERTHYR ❑

From the remains of the Aberfan staircase locks (ST 073991) the canal towpath can be walked to Ynysfach. Coal and iron workers settlements of Troedyrhiw, Gethin, Abercanaid and Upper Abercanaid. Canalside colliery and mine tips. Glyndyrus locks, boat dock and canal reservoir (SO 052046). VNR elliptical stone arched railway bridge (SO 050051).

T38 YNYSFACH IRONWORKS

SO 045061 ✶

An offshoot of Crawshays' Cyfarthfa works. Blowing engine house and four stone furnaces - two of 1801 and two of 1836 (one with inscribed cast iron key stone 'WC 1836'). Charging bank remains with stone arch to the furnaces.

T39 HOOVER FACTORY, MERTHYR

SO 057042 ✶

This large low 1946 building, designed by the same architects (Wallis, Gilbert & Partners) as Hoover's Perivale factory, still manages to suggest an Art Deco style.

T40 BLAENCANAID FURNACE

SO 037046 ✶

Remains of a small sixteenth century furnace which could not have been more than 12ft high. Merthyr's historian Charles Wilkins has never been forgiven for suggesting it was worked by pygmies.

T41 CWMDU AIRSHAFT AND FAN

SO 031051 ✶

Ventilation fan at the mouth of a small airway. A coal mine still with vestiges of its buildings.

T42 CWM PIT

SO 044043 ✶

Substantial stone remains of 1845-1926 Cyfarthfa-owned pit including base of chimney. Marks start of 1766 Cyfarthfa Canal to Cyfarthfa ironworks.

T43 CHAPEL ROW

SO 045067 ❑

Partly excavated short length of GCC alongside Cyfarthfa Chapel and cottages, birthplace of musician Joseph Parry. Re-erected artefacts - canal boundary stones, tramplates, cast iron canal bridges from SO 048053 and SO 056070 and cast iron road bridge from SO 050065. Culverted canal feeder from Cyfarthfa tailraces to below lock 1 is exposed between canal and river at SO 046066.

T44 JACKSON'S BRIDGE

SO 046066 ❑

Stone river arch 1791 built by GCC to carry road from the new Brecon road but also shared with Dowlais railroad and Penydarren tramroad to iron companies wharves at lock 1.

T45 CYFARTHFA IRONWORKS

SO 037070 *Photo: See page 1* ✶

Impressive remains of six (of seven) substantial stone furnaces mark the site of the Crawshay empire. The bases of the four later iron-clad furnaces and Cowper stoves visible in front. Iron was made on this site from 1767 until final closure in 1919.

McFarlane Fountain and Parish Church, Merthyr Tydfil *TWE*

T46 CYFARTHFA CASTLE

SO 042074 ❑

Built 1823 for William Crawshay II. Houses museum and art gallery with many artefacts illustrating the industrial history of Merthyr and the social life of the Crawshays. The ornamental pond supplemented the water supply to the Crawshay ironworks at Cyfarthfa.

T47 CYFARTHFA TRAMROAD ❑

Steeply-dropping route of mineral line from Winch Fawr to Cyfarthfa Iron Works. A good section of the route at Heolgerrig SO 031062.

T46: Cyfarthfa Castle *TWE*

T48: Pontycafnau tramroad *above* and *right* Gurnos tramroad *TWE*

T48 PONTYCAFNAU AND GURNOS TRAMROAD

SO 037072 ❑

Cast iron 1793 bridge designed by Watkin George carrying limestone tramroad from Gurnos quarry (SO 035084) and two water feeders (one in a trough beneath the tramroad and one on a high level aqueduct above) to Cyfarthfa ironworks. Probably the oldest cast iron railway bridge in Wales. At the bridge are remains of hydroelectric turbine house 1929-32 closed 1953. Limekilns at SO 038073.

T49 WINCH FAWR

SO 005073 to SO 018064 ✶

Spectacular landscape of 18th century and 19th century coal and ironstone levels, with hushing channels and gouges.

T50 TAI MAWR LEAT

SO 032077 to SO 037072 ❑

Charles Wood's (and William Edward's) original 1766 weir and leat from the Taff Fawr to the first Cyfarthfa furnace. Ditch runs alongside the river as far as Pontycafnau.

T51 MERTHYR TRAMROAD TUNNEL

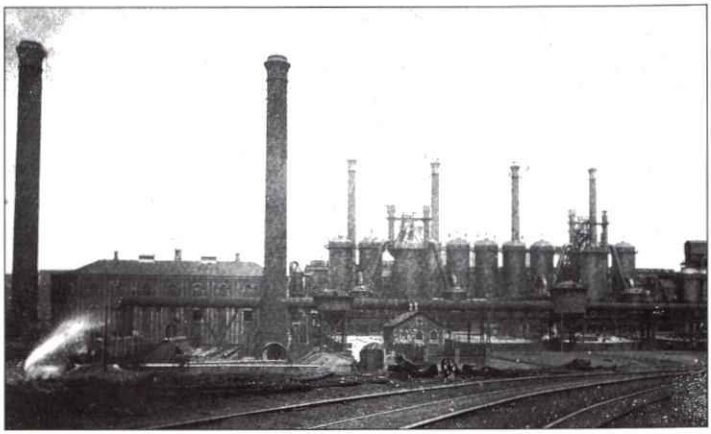
SO 057045 ✶

Southern portal (considerably rebuilt) of 1802 tunnel behind site of Plymouth ironworks.

T52 DOWLAIS IRONWORKS

SO 068077 ✶

Imposing brick blowing engine house built 1906 with nine bays, a portico of cast iron columns. All that remains in substance of the Dowlais ironworks.



T52: Dowlais Ironworks *SR*

T52: Dowlais Ironworks: the blowing engine house *TWE*

T53 DOWLAIS SETTLEMENT

The nineteenth century town plan and steep High Street still presents the atmosphere of an iron town built so close and around the ironworks themselves. It is easy to conjure up busy scenes of trains of iron rolling past Penydarren to the canal at Merthyr below.

T54 DOWLAIS STABLES

SO 066078 ✶

Built in 1820 this block dominates the old town. Allowed to fall down before finally being restored. Housed the ironworks school in its upper floor.

T55 GUEST MEMORIAL LIBRARY

SO 069078 ✶

Designed 1854 by Sir Charles Barry as a memorial to Sir Josiah John Guest but not completed until 1863.

T55: The Guest Memorial Library *TWE*

T56 DOWLAIS DRAINAGE

NE, E and SE of the ironworks site and the town. ✶■

The Brewhouse Level (SO 070076) at the back of the one-time furnace bank was, with Cae Harris Pond, the lowest point of this network. Surrounding this point are the remnant ponds, shafts and leats which, together with many miles of underground channel in the mine workings, supplied water to the production shops in the great Dowlais Works. A fine relic of the system at Sarn Howell SO 074061 on the road to Cwmbargoed.

T57 TREVITHICK MEMORIAL

SO 052067 ✶

[Temporarily removed at the time of writing.]

Commemorates Penydarren locomotive, designed by Richard Trevithick for Samuel Homfray and the world's first steam locomotive to run on rails. The event took place on 21 February 1804 when the locomotive hauled a train to Navigation on the MTR.

T58 MORLAIS LIMESTONE QUARRIES

SO 0409 to SO 0609 ❑

Quarries for the three Merthyr ironworks-Plymouth (NW), Penydarren (W) and Dowlais (N and NE). Tramroad and railway connections can be followed. The Plymouth quarry marks the northern end of the MTR.

T59 CEFN VIADUCT

SO 031077 ❑

770ft long and 120ft high 15-arch built 1866 for B&MR. Limestone with brick inverts, curved and inclined over Taff Fawr.

T60 PANT CEMETERY

SO 060093 ✶

Started as a cholera cemetery outside the town limits, the 48,000 burials here tell the tale of the

T59: Cefn Viaduct *TWE*

Guest empire at Dowlais Ironworks. Inscriptions tell of managers, chemists, bankers, foremen, metallurgists, puddlers, butchers and innkeepers. These last were made wealthy by the beer contracts for the workers. Welsh and Irish and Spaniard and Italian and Englishman are segregated. Many inscriptions describe accidents and a monumental mason's yard which produced many of the tombs still exists.

T61 PONTSARN VIADUCT VAYNOR

SO 045099 ✶

Eight-arch massive limestone structure of 1866 for B&MR.

T62 VAYNOR PARISH CHURCH

SO 049103 ❑

St Gywnno of 1870 paid for by Robert Thompson Crawshay. His Radyr Quarry stone graveslab inscribed 'God forgive me'.

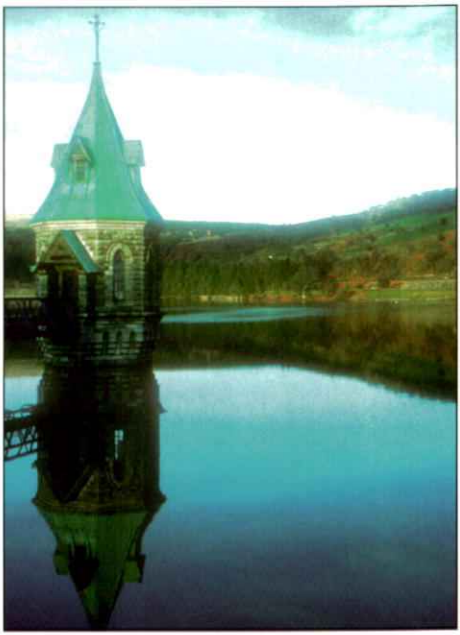
T63 CARDIFF WATERWORKS TAFF FAWR RESERVOIRS

SN995155, SN 997184 & SN 007117

Cantref reservoir (1886 and 323 million gallons), Beacons reservoir (1897 and 345 million gallons) and Llwynon reservoir (1927 and 1,260 million gallons) all within the Brecon Beacons, were built to supply water for Cardiff and Penarth. These supplemented water supply from the Penhill (1852, 2 million galls), Wenallt (15 million galls), Lisvane (1865, 80 million galls), Llanishen (1887, 317 million galls), Penylan and Llandough (640,000 galls) reservoirs which are situated in Cardiff.

T64 TAFF FECHAN RESERVOIRS

1832, 1849 and 1854 saw cholera outbreaks in Merthyr. This caused the laying of a pipe from Dolygaer on the Taff Fechan to Penybryn in the town. A reservoir was built 1858-62, the dam at SO 056144. The then-untreated water fed 11 standpipes and the ironworks, steam pumping being



T64: Taff Fechan Reservoirs

used. By 1880 increased demand led to Lower Neuadd at SO 030180 being opened. This, at 1,412ft. high meant that Dowlais, Pant, Quakers' Yard and Treharris could be supplied without pumping. 1902 saw Upper Neuadd at 1,500ft completed (SO 030188), with Cwmbargoed, Bedlinog, Abercynon, Merthyr Vale and high Treharris supplied.

The mushrooming of Barry and the needs of Rhymney and Pontypridd added to those needs already existing and Pontsticill (SO 061119) was planned in 1910, delayed by WWI, and opened in 1927. The combined recipients had by then formed the Taff Fechan Water Supply Board.

TAFF TRIBUTARIES: RHONDDA VALLEY

TR1 HETTY PIT WINDING ENGINE

ST 059908 ✶

Most prominent surviving feature of Great Western Colliery. Engine and fan house with, in situ, the 1875 horizontal winding engine with 36-inch cylinders, heavily rebuilt 1906. Alleged to be converted from flat rope during rebuilding. Colliery closed 1983 and site now responsibility of Rhondda Heritage Park, although not normally accessible yet.

TR2 TREHAFOD VENTILATION FURNACE

ST 043912 ✶

Square brick chimney and furnace chamber at entrance to ventilation drift.

TR3 RHONDDA HERITAGE PARK

ST 039911 ❑

Formerly Lewis Merthyr Colliery, sunk in the 1870s, closed in 1983. Buildings include the two oldest headframes remaining in Wales, two winding-houses, with an electric and a steam winder, complete pitheads, a lamproom and two fan houses. Trefor Shaft (Winding House dated 1878) ceased production in 1958 and Bertie Shaft (Winding and Compressor House dated 1890) ceased production in 1960. Between the two shafts are the Lamproom and Fanroom. The site is now administered by the local authority and open to the public.

TR4 WELSH HILLS WORKS

ST 029911 ✶

Redbrick 'Corona' mineral water factory in Jenkin Street, c1900, with 5-storey tower and impressive arched entrance. Re-opened 2000 as a television production facility and recording studio, and now achieving national fame as 'The Pop Factory'.

TR5 LLWYNPIA - THE SCOTCH HOUSES

SS 992932 ✶

Erected 1865 on for workers at Archibald Hood's steam-coal sinking which at that time was a daring enterprise. The houses pre-date the Rhondda Sanitary Board's Regulations and have pedestrian access only. Numbering more than two hundred, they are a rare survival. Here at what became the

above: Tylorstown, Rhondda Fach *TWE*
left: TR7: Parc and Dare Institute *TWE*

Glamorgan Coal Company a huge brickworks and coking-plant were opened in 1863 and by 1876 the final No 6 pit was producing. Fine statue of the creator of Llwynpia, who came from Ayrshire.

TR6 GLAMORGAN COLLIERY ENGINE HOUSE

SS 993933 ✶

Sizeable brick relic of the huge Glamorgan colliery. Built 1905 and stormed in 1910 during the Tonypandy riots.

TR7 PARC AND DARE INSTITUTE

SS 958966 ✶❑

Cwmparc (W) saw Parc and Dare collieries open in 1865 and 1870 respectively. Helped by the Ocean Coal Company the Workmen's Hall opened in 1895. The 1913 classical addition dominates, being four-storey. Theatre layout inside with iron cherubs, snakes and flowers on the columns and notable stained glass.

TR8 SCWYD LEVEL

SN 922016 ✶

Locomotive-type boiler survives outside small level with superb outcrops of the top horizons of the Coal Measures.

TC3: Gadlys Ironworks: *see opposite* *TWE*

TC1 CWMAMAN FURNACE

ST 004994 ✶

Low-height remains of a late 16th century blast-furnace.

TC2 ABERDARE MARKET HALL

SO 005025 ✶

A now rare example. Built 1853; architecturally competitive to beat rivals at Merthyr (1838-demolished) and Dowlais (1844-demolished).

TC3 GADLYS IRONWORKS

SO 00l030 *Photo: see previous page* ✶

A fine group of works buildings including two blast-furnaces, a blowing-engine house, casting-house and workshops. Founded 1827 by Matthew Wayne ex-Cyfarthfa. It is believed that the striking refurbished engine-house was contemporary with the final pair of furnaces of 1855-56. To the SW lie the calcining furnaces set into a bank in Elm Grove. Production ceased in 1866.

TC4 ROBERTSTOWN TRAMROAD BRIDGE

SN 997036 ❑

An iron bridge made at the local Abernant Ironworks and bearing the date 1811. It allowed the Aberdare Canal Co.'s tramroad, running from the NW, to cross the River Cynon. Thought to be the sixth oldest iron rail bridge in the world, has iron decking plates with chairs and hoofway to aid the horses.

TC5 GELLI ISAF (LLWYDCOED) TRAMROAD BRIDGE

SN 990043 ❑

Stone bridge with 1834 keystone but replacing 1804 bridge crossing the River Cynon and carrying Tappendens tramroad from Abernant and Llwydcoed ironworks to the Neath canal via Hirwaun. When the Aberdare canal was opened in 1812 its tramroad joined Tappendens at this bridge. The tramroad routes are clearly evident here and may be walked.

TC6 GAMLIN VIADUCT PIERS

SN 982049 ❑

Two wooden Brunel fan viaducts were built on the broad-gauge Dare and Amman branch of the VNR. The piers of the larger 600ft long viaduct survive. Smaller Dare viaduct was at SN 992026. Branch closed 1939, demolished 1947.

TC7 NANT HIR DAM

SN 989068 ❑

Built 1871-5 by an Aberdare contractor for the UDC. 75ft high puddle-clay core dam with 'rock gravel' supportings faced with stone.

TC8 HIRWAUN

Hirwaun is an early industrial centre surrounded by the marks of three-hundred years of activity. Straddling high ground above and between the Neath Canal head and the Aberdare Canal head its streets mirror the tramroad routes connecting to both. It is positioned at the changeover from anthracites (W) to steam coals (E). Thus to the W iron-smelting had generally to wait until post-1828 (Neilson's hot blast) to follow on from the charcoal era, whereas to the E cold-blast was feasible. Such was the profligacy with abundant low-ash coals that many smelters continued with cold-blast for decades.

TC9 HIRWAUN IRONWORKS

SN 958058 ❑

Present site commenced 1757 by John Maybery. A charcoal-fuelled enterprise could have been here prior to the 1660s. In 1813 two large 40ft tall furnaces were here and then William Crawshay rebuilt the works to a high standard after taking over in 1819. A visitor in 1824 would have observed four furnaces blown by steam engine, also new cast houses and forges. Nearly sixty years later the furnaces were increased in height heralding the fading of activity here.

The quartet of furnaces largely survive with the charging-bank details readily observable.

Manager's house site can be made out NW and two limekilns NE. Vast curved drystone tramroad causeway across the Cynon, with sleeper blocks.

TC10 TOWER COLLIERY

1 mile and 2 mile W of Hirwaun ■ ⚙

Tower No 4 shaft and headframe of 1940-41 with PD engine room at SN 926043 and Tower No 3 drift and adjacent washery at SN 942049. Opened originally by Bute Trustees in 1878 and much redeveloped 1958-59. Worked historically in steam coals, now produces anthracite. Compressors at the No 4 site are functioning museum pieces. Washery uses flotation method. Since 1994 run by the workforce.

EL1 PENARTH DOCK & TOWN

ST 1872 ❑

Promoted by the TVR in disguise and opened in 1865 in the lee of Penarth Head overlooking the Ely estuary and Cardiff docks. This was the TVR's original favoured location in the 1830s but they were persuaded by Bute to use his new dock at Cardiff. Penarth dock was extended in 1884. From here Brunel's SS Great Britain left in Feb 1886 for the Falkland Islands on her last commercial voyage.

Now the reduced-size dock and basin is a marina and is surrounded by modern 'anywhere waterfront' housing. The basin entrance is within the Cardiff Bay barrage. Note the stone bases of the coal hoists and the use of Radyr stone (from the nearby Cogan quarries). The outstanding survivals are the grand dressed stone 1865 dock offices, Marine Hotel (with many TVR features and mansard roofs) and Custom house.

On the headland above is the imposing TVR hotel now Headlands School (ST 189723). Penarth has some very large Victorian residences characterised by the use of lias limestone in contrast to the Pennant sandstone used in Cardiff properties. The seaside pleasure pier (ST 189714) was built in 1895, designed by H. F. Edwards.

EL5: Cwm Coke Ovens *TWE*

EL2 PENARTH ROAD PUMPING STATION

ST 168738 ❑

A fine yellow brick building with red brick dressings built 1907-10 as a sewerage pumping station. Stands beside the River Ely. Now an antiques centre, many traces of its original equipment can be seen, including footings of the oil engines.

EL3 LECKWITH BRIDGE

ST 159752 ❑

A stone bridge across the River Ely was here as early as 1536. A three arch stone bridge, with cutwater refuges, survives and is an ancient monument. Alongside it, taking the present traffic, a reinforced concrete single arch opened in 1935. A concrete viaduct continues the road on the south side on to the hillside.

EL4 ELY BRIDGE MILEPOST

ST 147769 ✶

The most visible survivals of local turnpikes, apart from the routes themselves, are a number of magnificent cast-iron mileposts. One is in the Museum of Welsh Life, at St Fagans, and another is prominent at Ely Bridge. Two more are alongside Cowbridge Road West.

EL5 CWM COKE OVENS, LLANTWIT FARDRE

ST 0686 ✶

NCB coke ovens of 1958 which continued in operation after closure of the nearby pit but which finally closed under privatisation in 2002.

EL6 LANTRISANT OR YNYSMAERDY COLLIERY

ST 033841 ■

Substantial remaining 20th century buildings situated on Ynysmaerdy Farm, near the Royal Mint; an outstanding complex built for PD after the Great war and closed in 1942. This site retains an impressive common engine-hall (ST 032840), now in agricultural use, which housed two electric winding engines, various compressors and possibly a fan house at the southern end. Also on site are the north and south winding houses (ST 032841 and ST 032839), the former Colliery Offices (ST 032839) and the much-altered Colliery Workshop.

O1 PORTHCAWL DOCK

SS 820764

Porthcawl Docks (1½ acres of water) were built in the 1820s by the Duffryn Llynvi & Porthcawl Railway, a horse drawn railway of 4ft7in gauge, but the GWR closed the docks in 1898. On the south of the remaining harbour stands a large limestone built warehouse, now occupied by the RNLI. A length of 'preserved' rail on the quayside is now sadly neglected. At the south eastern end of the breakwater stands a small hexagonal cast iron harbour light, 15ft high, of 1866. It is one of only two surviving cast iron lighthouses in Wales.

O2 BRIDGEND MUNITIONS FACTORY

Waterton and Brackla

SS 925790 & SS 920810

Royal Ordnance Factory, an overspill country branch of Woolwich Arsenal, opened in 1938 on the outskirts of Bridgend. Constructed in two adjacent but distinct sections at Waterton and Brackla, one for storing ammunition and the other as a shell-filling factory for the Navy. Shell casings were also made here. It operated for the duration of WW2 and at its peak over 40,000 employees were on the site; perhaps the largest single factory employer in the UK, ever? The site is now an industrial estate but many original buildings are visible, including seven of the eight rail-served underground magazines.

O3 BRIDGEND RAILWAY STATION

SS 907798 ✶ ❑

The refurbished station includes two SWR buildings of 1850 on the westbound platform. Designed by Brunel, the larger single-storey pavilion retains wide overhanging roof on both platform and entrance sides. The smaller square block lies under this same roof. Typical arched windows and decorative detail.

O4 ANGELTON BLAST FURNACE

SS 904819

Built in 1589, this was the only attempt to introduce a blast furnace into central Glamorgan before the eighteenth century. The furnace was still in use in 1600 and remains are barely recognisable.

O5 GLAN-RHYD RAILWAY VIADUCT

SS 899828 ✶

Three stone arches 1829 on Bridgend Railway, a horse-worked connection to the DL&PR. Has some architectural pretension. Nestles beneath the M4.

O6 CEFN CRIBWR IRONWORKS

SS 861835 ❑

John Bedford, of Birmingham, built this single charcoal-fuelled furnace post 1771. A high-level charging ramp to the furnace with three calcining kilns and the ruins of the casting-house below. A later 1820s beam-engine house (all indoors) survives.

O8: Tondu Ironworks, calcining kilns
see over

SR

Bedford died in 1791 and thereafter the site was used only 1826-36, by William Bryant of Merthyr Tydfil. Partly as a result the ruins are one of the best fairly complete small, later eighteenth-century, ironworks.

To NW are CEFN CWSG COKE OVENS, remains of mid-19th century ironworks owned by Malins and Rawlinson and which closed in 1900.

O7 ABERKENFIG RAILWAY BRIDGE

SS 894830 ❑

Horse-drawn tramroad, the DL&PR built 1820s. Bridge is coursed rubble-stone on a once important route to Porthcawl Harbour.

O8 TONDU IRONWORKS

SS 891845 ❑

Established 1820s but came into its own after 1853-54 takeover by John Brogden & Sons. Two furnaces and a forge plus one-hundred coke ovens were functioning, the last furnace until 1895. Stone-faced charging bank with a brick-lined lift shaft and a three-storey blast-engine house. Seven extant calcining kilns on the charging bank with ranks of beehive coking ovens behind them.

Worker's houses in Park Terrace, with official's housing below. The present-day retirement home is considered to be the company shop.

O9 LLYNFI IRONWORKS

SS 849918 ✶

Known also as the Cambrian Iron Works and founded in 1837 with an imposing three-storey engine house of 1839. This has very stylish contrasting relieving arches and round-head windows to add interest and vitality to a very large structure. They come no better than this, particularly when conserved and tastefully re-used as here. It is now the Sports Centre entrance and one of the four furnaces survives in the associated car-park.

On the opposite riverbank at SS 851918 are four rows of worker's houses.

O10 CYMMER VIADUCT

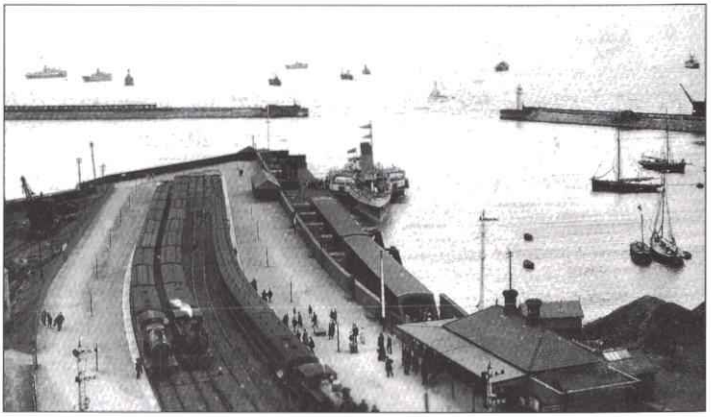
SS 858962 ✶

GWR 1879 extension into and across Avon valley, joining Llynvi Valley line to SWMR via Cymmer tunnel. A mixture of arched approaches, 3 stone piers supporting steel lattice with timber beams and decking.

GC1: Flat Holm: cholera hospital and lighthouse: *see opposite* *MJM*

GC3: Barry Docks

TWE



GC1 FLAT HOLM

Bristol Channel

ST 222648 ❑

Despite its location, Flat Holm is administratively part of the City of Cardiff. An SSI, it is roughly 500 yards diameter and for such a small island has a remarkable collection of industrial remains. The lighthouse was erected by Bristol Merchants in 1737, as a coal burning light, becoming oil burning in 1820.Trinity House took over in 1823 and in 1866 a new lantern (which still survives in place along with the iron gallery) and new powerful optic were fitted, raising the height to the present 90ft. Electrified 1969 and automated 1988. A substantial foghorn no longer operates. The limekiln near the farmhouse dates from at least 1790.

In 1866 the island was fortified with four gun batteries, equipped with nine rifled muzzle loading guns mounted on Moncrieff carriages. All four batteries survive and some of the gun barrels, or parts of them, but not, alas, the carriages. The extant barracks is dated 1869.

During the WW2 anti-aircraft and anti-ship batteries were installed, serviced by a 60cm gauge railway, allegedly a captured German feldbahn from the Great War. The line of the railway can be traced.

Fearful of cholera the Cardiff Port Authority erected a tented isolation hospital on the island in 1883 and by 1886 this had grown to 'a shed capable of holding six beds'. A purpose built hospital for 16 patients was erected in 1896 and it is the remains of this, abandoned in 1937, that now survives.

In May 1897 Guglielmo Marconi transmitted the first radio message over water to the island from Lavernock Point, the nearest part of the mainland.

The island is now administered as the Flat Holm Project as part of Cardiff City Council to conserve the history and wildlife of the island with a resident warden. Regular trips are run from Barry.

GC2 HAYES WINDMILL AND OTHER WINDMILLS

ST 141679 ✶

A tall tower mill of 1812, part of a model farm now in the grounds of BP Chemicals. Wooden upright shaft with wallower and cast iron spur wheel and two pairs of under-driven stones. Only windmill in mainland Wales with surviving machinery. Another similar model farm at nearby Cog (ST 163688) also had a windmill.

Other shells of tall tower mills on Vale of Glamorgan are at St Y Nyll (ST 099783), Frampton (SS 971693) and Wick (SS 926720). Remains of more primitive shorter parallel sided mills similar to those across the channel in Somerset are at Wick (SS 924720), Llantwit Major (SS 962686), Newton Down (SS 839789) and Merthyr Mawr (SS 867777).

GC3 BARRY DOCKS AND HARBOUR

ST 1267 ✶

Opened 1889 promoted by the Rhondda, Ogmore and Llynfi valley coal owners when Cardiff's Bute Docks proposed increasing their rates by 1d per ton - hence 'the dock built for a penny'. Shipped over 3 million tons in its first full year of operation.

GC3: Barry Docks *TWE*

Integrated railway system to Bridgend, Rhondda and (from 1901 after No 2 dock of 1898 opened) the Rhymney valley. Holds the coal export record over Cardiff of 11 million tons in 1913. The magnificent Wren style dock offices are on the town side with a statue of David Davies outside.

Dock entrance is alongside Barry harbour and pier (a stone breakwater) on the leeward side of Barry Island. Harbour railway approach is through a tunnel from the Island station which in turn was served by a causeway from the mainland. For a brief period before the Great War BR operated pleasure steamers from the pier. Much of interest in the docks including hydraulic pump house and machinery. Sliding bridge across dock entrance, dry docks, railway approaches and surviving stone plinths of the dockside coal hoists.

The Vale of Glamorgan Railway society operates steam trains from the expertly refurbished original BR Island station (ST 115667). Surviving buildings of BR locomotive repair works (ST 112677).

GC4 BARRY SIGNAL BOX

ST 108673 ✶

BR Evans O'Donnell brick of c1897. 77-lever frame with GWR vertical-tappet interlocking. Rusticated timber decoration.

GC5 BARRY ISLAND SIGNAL BOX

ST 113667 ✶

McK&H 1929, now disused. 22 levers with Evans O'Donnell frame. Ex-Nantgarw, CR.

GC6 PORTHKERRY VIADUCT

ST 093673 ✶

Spectacular 16 span crossing, 1,125ft long and 110ft high. On route of VGR line from Barry to Bridgend now used mainly for Aberthaw power station. Opening date for the line was December 1897. The viaduct had however taken from 1894 to July 1897 to construct due to foundation failure and then on 10 Jan 1898 a pier subsided. A temporary 2 mile 44 chain diversion was built without an Act, opening April 1898 and carried passenger and goods traffic until the full re-opening of the viaduct in April 1900.

GC7: Aberthaw Old Lime Works *TWE*

GC7 ABERTHAW OLD CEMENT WORKS

ST 038662 ❑

Roofless building with beds for crushers, two tall shaft kilns and a square brick chimney. Set up c1850 by David Owen, owner of 'Western Mail' newspaper 1888-1926. Works closed 1910 and nearby Rhoose Cement Works opened 1911.

GC8 ABERTHAW SIGNAL BOX

ST 034666 ✶

BR 1897 with GWR frame of 1962 and vertical-tappet interlocking. Unique design for VGR.

GC9 NASH POINT LIGHTHOUSES

SS 918681 ❑

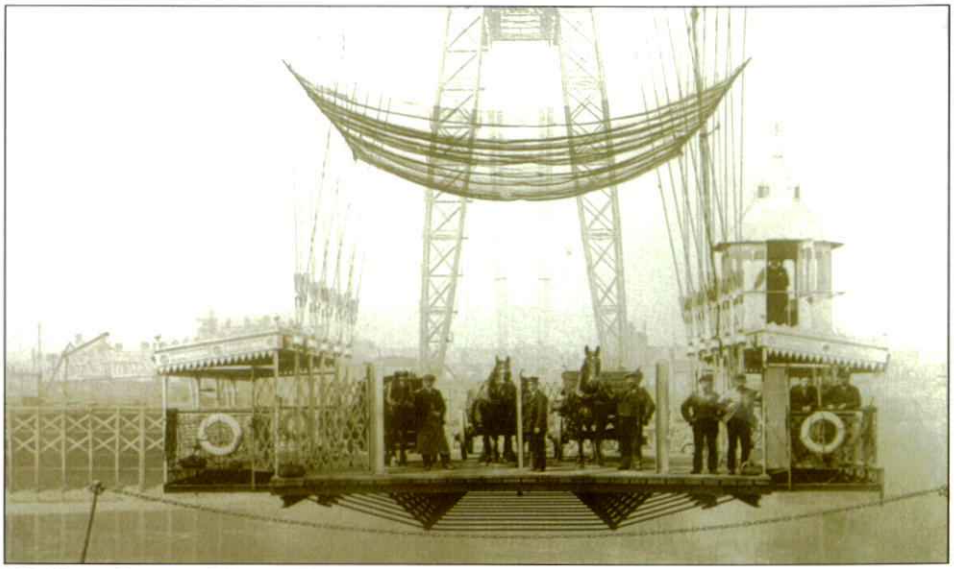
A pair of fine aligned towers built in 1832. The lower, western, light was 67ft high and has an original keeper's cottage attached to the west. This light was out of use by the early 1970s and its lantern removed. The eastern tower is still in use and is 122ft high. The present lantern was fitted in 1867.

GC10 BROUGHTON MALTINGS

SS 922710 ❑

3-storey 6-bay stone-built maltings with 4-storey barley kiln. Altered through use as 'welfare hotel' for colliers from 1905 and then conversion to flats c1964.

GC9: Nash Point Lighthouses *TWE*



NP2: Newport Transporter Bridge, and (*below*) the bridge today *CRW*

Newport, established as a Norman settlement at the lowest bridging point on the Usk, with a substantial castle, was for centuries an important trading port with extensive riverside wharfage. This has been demonstrated by the discovery and excavation for conservation in 2002 the very well preserved hull of an 80ft long trading vessel dating from 1465-6.

Its industrial significance was established in 1799 with the opening of the Monmouthshire Canal linking it in two arms with Pontypool and Crumlin. A further link with the B&A Canal at an end-on connection at Pontypool opened a through route to Brecon in 1812.

The opening of the Rumney Tramroad (1826) completed the scene, leaving Newport as the outlet for all the industrial (iron and coal) production of the Monmouthshire Valleys (Rhymney, Ebbw, Sirhowy and Afon Llwyd. Although eventually eclipsed by Cardiff, the tonnage exported through Newport was the highest in south Wales for much of the 19th century. The town Dock was constructed in 1842 and extended in 1858, whilst the final dock developments were Alexandra North (1875) and South (1907), almost exclusively equipped for coal export. The town's population in 1996 stood at 136,000 and the decline to zero of coal exports after WW2 has been replaced (for the moment at least) by steel and its associated activities, light engineering and extensive electronics industry.

NP1 NEWPORT ALEXANDRA DOCKS (NORTH AND SOUTH)

ST 320850 ■

Built 1875 and 1907 respectively, with locks direct to the open sea, these were primarily coal exporting facilities, although handling mixed inward cargoes. The entrance locks have to handle the second highest tidal range in the world, average 46ft.

NP2 TRANSPORTER BRIDGE

ST 318861 ❑

The lowest crossing of the River Usk, to accom-

modate passage of high-masted ships to the Town Dock. Designed by French engineer, F. Arnodin, and built in 1906, it comprised four steel lattice towers 245ft high, supporting a flexible deck at a clearance of 175ft. From this is suspended a travelling gondola, capacity six motor cars, electrically driven from an elevated control cabin on the east bank. General arrangement of the bridge is cable suspension, with the cables secured at each end in massive masonry counterweights. The bridge was fully restored to working order 1992-5 and subsequently re-listed Grade 1.

NP3 ORB STEELWORKS (LYSAGHTS)

ST 325865 ■

Opened in 1899 as a production facility for the Wolverhampton based John Lysaght Ltd, initially the works rolled sheet steel for galvanising in Bristol. Substantial wharfage on River Usk (using the first electric travelling crane in the world). Developed for production of sheet steel for the motor industry through 1920-30s, also specialising in a whole range of electrical steels which are still manufactured at the works.

NP4 NEWPORT MALTINGS

ST 325866 ✶

Three-storey red-brick structure retaining original appearance (c1896) alongside entrance lock to Town Dock.

NP5 NEWPORT TOWN DOCK

ST 320870 ❑

Built in 1842 (contractors Rennie & Logan), the town dock provided an outlet for products brought down the MCC. Closed and filled in during the 1930s, the site is still undeveloped. The entrance lock (dry) has been preserved.

NP6 BALTIC WAREHOUSE

ST 320870 ✶

Situated to the west of the Town Dock entrance lock this warehouse, for many years used for oil blending, is one of the original dockside buildings. Dating from mid-1840s it is a three-storey dressed stone structure, with cast iron roof members and window lintels.

NP7 CANAL WAREHOUSE

ST 319869 ✶

Located east side of MCC (c1799), built of red sandstone and white limestone. Upper loading door facing canal and arch providing entrance for boats. The canal was filled in c1930.

NP8 NEWPORT CATTLE MARKET

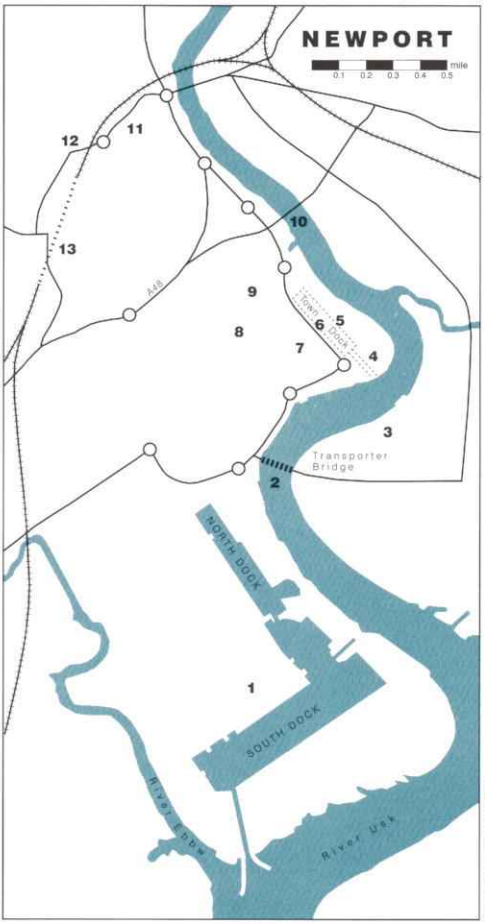
ST 315870 ❑

Single storey lairage sheds built of red sandstone 1844. The complex cast-iron roof members are marked '1844 - Tredegar Ironworks'. Window lintels are cast iron, and outside is a cast iron plaque showing a bust of Samuel Homfray (Penydarren ironworks), the market's founder.

NP9 MONMOUTH RAILWAY YARD, NEWPORT

ST 316872 ■

Close to its Dock St. station the company erected its locomotive works and running sheds at Bolt St., then the official name. The running shed was in two portions; a four-road part with a traverser section to the S. After a fire in 1918, the premises were closed and replaced by a new four-road GWR building on the N end of the original site. Opened in 1920 and called Dock St. it became a wagon repair shop in 1929 and still survives as an Enterprise Park.



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NP10 GEORGE STREET BRIDGE

ST 319877 ❑

Built 1962-4 to the design of Mott Hay & Anderson, the first example of a cable-stayed cantilever construction in Britain.

NP11 WESTGATE SQUARE

ST 310881 ❑

Focal point of Chartist riots November 1839, outside the former Westgate Hotel.

NP12 GODFREY ROAD CARRIAGE SHED

ST 306882 ✶

Remarkable survivor of 1854 broad-gauge SWR yard which contained an engine shed, offices, a coal stage and water tank and the extant carriage and wagon shop. 10 bay 4-track wide gabled single-storey in limestone with slated roof.

After wholesale conversion to narrow-gauge in 1872 the engine shed was demolished in 1916. Curiously, after 149 years locomotives again stable on the original site.

NP13 HILLFIELD TUNNELS

ST 304874 to ST 306879

Two parallel bores, the earlier one Brunel's 1850 SWR with monumental rock-facings and oversize portals (as Twerton, St.Annes and Box on GWR). Also twin-track but narrow-gauge the N tunnel of 1912 with a matching gaping portal in engineering brick. Length 2,226ft.

NP14 ALEXANDRA DOCKS DISASTER MEMORIAL

St Woolos Cemetery

ST 295875 ❑

Bronze mounted obelisk in memory of 34 workers killed on 2 July 1909 when the walls of the new entrance lock collapsed.

NP13: Hillfield Tunnels *TWE*

NP15 MAESGLAS

ST 282872

Three railway bridges in parallel; Monmouth Railway Co (stone 1853), Alexandra Newport Docks & Railway Co (blue brick 1878), GWR (steel over stone piers 1895).

NP16 PARK JUNC. SIGNAL BOX

ST 294862 ✶

McK&H (GWR)1885 extended 1899. A huge largely redundant box with 100 levers and horizontal tappet interlocking.

NP17 TREDEGAR HOUSE MILL

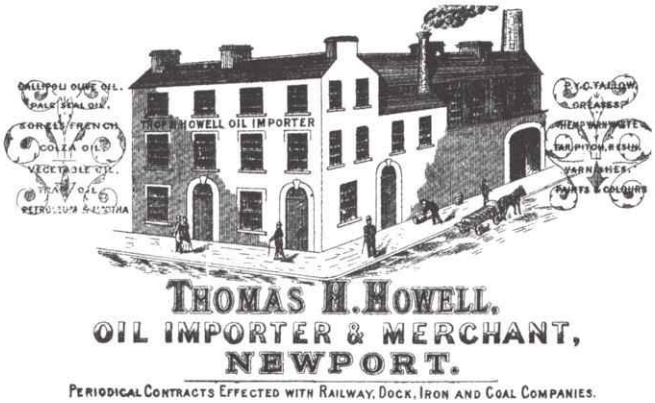
ST 289851 ❑

Brick three-storey with extant machinery. First recorded in 1827.

NP18 INMOS SEMICONDUCTOR PLANT

ST 292858 ✶ ⚙

Designed by Richard Rogers & Partners in 1982, this 'inside-out' building is intended to keep sterile production areas clear of internal obstructions. The main structural steel members are exposed, as are the rooftop service modules, linked by snaking ducts to the interior.



RH1 IRON BRIDGE, DRAETHEN

ST 230870 ❑

Three-arch accommodation bridge across River Rhymney. Cast-iron structure dated 1829, wrought iron railings. Almost certainly manufactured in Rhymney Ironworks.

RH2 TOLL HOUSE, LOWER MACHEN

ST 225880 ✶

Survivor of Caerphilly Turnpike, c1800, now alongside A468.

RH3 MACHEN QUARRY

ST 223887 ■

Large dolomitic limestone quarry, supplying roadstone, railway ballast and flux for steel manufacture. Quarrying and lime-burning on site date back to 18th century. The RT (later B&MR) runs through site, and this line still provides an outlet for stone. Limekiln remains on site and attractive 'church tower' style 1920s transformer house.

RH4 BRECON & MERTHYR RAILWAY WORKSHOPS

ST 218892 ✶

Extensive workshop remains, now roofless and heavily overgrown, standing alongside existing track near remains of Machen station. Some of the buildings are from the predecessor, RT (1826-63).

RH5 DRAETHEN LEAD MINES

ST 215875 ❑

Extensive lead workings, both surface and shaft, dating from Roman time to mid-19th century. Roman and Viking artefacts have been found. Site now heavily forested.

RH6 MACHEN VIADUCT

ST 202890 ✶

Constructed by B&MR in 1864, carrying a branch of the railway towards Caerphilly where it linked end-to-end with the PC&NR providing an exit for Rhondda coal via the Rhymney valley and Newport in 1878. 4 Masonry arches with two girder spans (now removed) crossing the R Rhymney and an adjacent tramroad.

RH7 MACHEN FORGE AND TINPLATE WORKS

ST 195881

Ruined stables remaining near the disused viaduct are the sole remains of the sixteenth century forge and the succeeding tinplate works of 1826-86.

RH8 WATERLOO TINPLATE WORKS

ST 193882 ✶

Roofless remains of tinplate works, opened 1875, ceased working in 1941 but used as Naval storage depot in WW2. 4 mills, converted to electricity 1922.

RH9 RUMNEY TRAMROAD BRIDGES

ST 171893 & ST 173893 ❑

Tow cast-iron girder bridges inset with flagstones and masonry parapets. Girders carry narrative: 'RUMNEY RAILWAY 1863. EAGLE FOUNDRY, CARDIFF'. The last major engineering works of RT before taken over by B&MR.

RH1: Draethen Bridge *CRW*

RH10 BRYNGWYN COLLIERY ENGINE HOUSE

ST 162893 ✶

Surrounded by housing, this lofty c1868 three-storey sandstone and brick structure contained an inverted engine on the upper two floors. The space beneath held a cranked beam powering the pumping rod system. To be seen are two apertures in the ground floor, one for the rods to the adjacent and visible drift and the other for the balance box. A unique layout.

RH11 CAERPHILLY WORKSHOPS

ST 167865 ■

In 1901 the RR moved its rolling stock operations to here from Cardiff Docks. After GWR amalgamation TVR and B&MR work was undertaken. A new Erecting Shop was built by the GWR, work on locomotives commencing in 1926. After 1923 no new carriages or wagons were built but repair work continued. Other new buildings and machinery turned the factory into a major GWR facility. Closed 1963 with the onset of dieselisation and became a Trading Estate.

RH12 LLANBRADACH COLLIERY

ST 148908 ✶

The colliery operated between 1894 and 1961 and fine ranges of pennant sandstone buildings remain, in secondary industrial use, on the west side of the valley, with a high stone retaining wall supporting those on the higher level. The more southerly of the two ranges on the higher level was a large winding-house with an arched recess on its south east gable formerly carrying winding-cables across to the shaft that stood on the valley bottom.

RH15: Penallta Colliery *TWE*

RH13 YSTRAD MYNACH MILL

ST 146929 ✶

Stone built corn mill building with surviving overshot waterwheel but no internal machinery. Late 18th century. Alongside the former main road.

RH14 YSTRAD MYNACH SIGNAL BOX

ST 140936 ✶

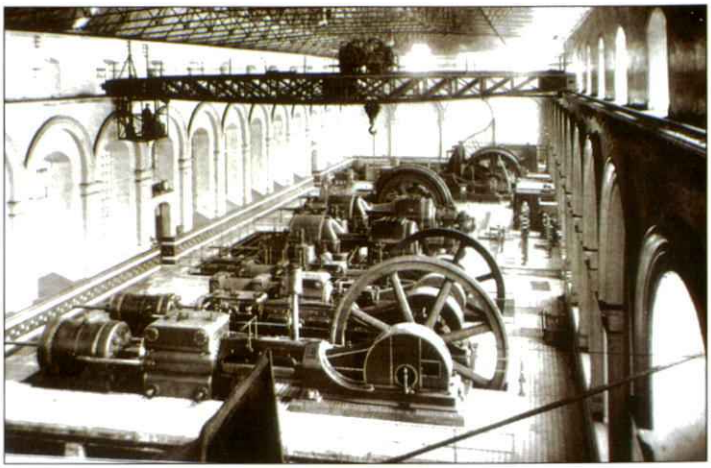
RR by McK&H of unknown date. Has 45 levers, tappet locking and an unusual outdoor timber platform to allow 2 x 90° turns in the point rodding.

RH15 PENALLTA COLLIERY

ST 139958 ✶

The mighty Powell Duffryn Steam Coal Co. commenced sinking in 1905 and by 1910 were experiencing huge difficulties in opening out the Red Vein due to faulting. The No 1 and No 2 shafts of 21ft diameter are respectively 2,340ft and 2,256ft in depth.

The machinery was all under one roof in a hall 300ft by 70ft. The winders were made by Fraser & Chalmers, No 1 a spiral drum 15ft-24ft with a double tandem Corliss compound engine and No 2 a 15ft drum with a Corliss cross-compound engine. Ventilation was by Sirocco fan of 12ft 10in



RH15: Penallta Colliery *TWE*

RH17: Butetown *TWE*

diameter, interestingly driven by a Davey Paxman high-speed compound and a 550hp Westinghouse motor. 23MW turbo-generators, two compressors and a compound generator were also housed. Fan casing on E end of hall. This showcase layout was modernised in the 1960s but much of the Art Nouveau tiling is undamaged. Headframes survive, steel joist construction of 1906 but the boilerhouse and chimney have been demolished. This leaves the 266ft by 46ft workshops, lamp room and offices, the oil and general stores and locomotive shed. 1938 saw erection of the baths to a modernistic Welfare Committee design. This contrasts with the pilasters, string courses and eave courses in red brick which decorate the sandstones of the Edwardian buildings.

RH16 ELLIOT COLLIERY ENGINE HOUSE

SO 147027 ❑ restricted

Situated on East Elliot shaft of 18ft diameter, sunk 1888-90 to 1,212ft on the Big Vein this was a PD pit. The two-storey engine-house carries an 1891 inscription, the opening out of the shaft into the coals causing floods which held up development. Contained within is an advanced form of steam winder. A four-cylinder tandem compound from Thornehill & Warham of Burton-on-Trent turns a 26ft to 15ft bi-cylindro-conical drum, a form of gearing born and fostered in South Wales.

West Elliot pit was of 18ft diameter and identical depth, sunk in 1883-85. Closure was in 1967.

RH17 BUTETOWN, RHYMNEY

SO 104092 ✶ ❑(One house)

In 1802-04 R. Johnson, the Union IC's work's manager dreamt up a scheme for a model town, a layout drawing indicating twelve streets. In the event three streets were built with foundations for a fourth, being parallel and architecturally composed along their length. Classical in flavour and oddly sitting in the hills they have a country estate look. One house is internally fitted as a museum, open at certain times. The re-furbishment of the entire settlement won a Prince of Wales Award.

The 'Union' at one stage included the second Marquess of Bute, the land here belonging to the Bute Estate.

To the E at SO 108903 Upper Furnace Ironworks remains lying N-S (Private), possibly the first in the Rhymney district and of 1801. Farmhouse and stables with 1802 date, manager's house and furnace with slag 'bear'.

below: RH17: Butetown, Union Ironworks *TWE*

'DUFFRYN-ABERDARE' SMOKELESS STEAM COAL

PRODUCED AT

The "TOWER" Colliery, Aberdare.

Proprietor, The Most Hon. The Marquess of Bute, K.T.

Shipping Agent—Mr. SAMUEL JAMES, Cardiff.

THE POSITION OF THE COLLIERY ENABLES THE COAL TO BE SHIPPED AT CARDIFF, NEWPORT, AND SWANSEA, AT BUYER'S OPTION.

The Coal is of a dry description, and is well adapted for Stationary Engines, and mixed with a bituminous Coal, suits admirably for Marine and Locomotive purposes. Facilities for mixing at Port of Shipment.

EB1 TREDEGAR PARK TRAMROAD

ST 282866 ❑

Tramroad connecting Tredegar Park Forge with Sir Charles Morgan's Park Mile Railway. Crosses River Ebbw on stone-piered bridge, with later (1870) cast iron span. Earliest record of forge mid-1500s, finally closed 1822.

EB2 BASSALEG VIADUCT

ST 278871 ✶

MCC's tramroad. Inscription carved in centre pillar, south side, 'RUMNEY RAILWAY 1826'. Probably oldest railway bridge in the world carrying full loads. Currently a mineral line serving Machen Quarries [RH3] (ST 223888).

EB3 PYE CORNER

ST 282873 ❑

Meeting point of three tramroads; Rumney (from Rhymney Ironworks), MCC's tramroad (Ebbw and Sirhowy Valleys) and Park Mile Railway (a short stretch through Tredegar park, owned by Sir Charles Morgan).

EB4 FOURTEEN LOCKS, MCC

ST 283897 ❑

On the Crumlin Arm, built 1792-9, fourteen locks grouped in pairs with side-ponds, achieving a rise of 268ft in half a mile. Designed by T. Dadford junior. Except for the top lock, which was fully restored in 2002, the restored flight is gateless. Interpretation centre at top of flight.

EB5 RISCA LONG BRIDGE

ST 239908 ❑

The east abutment is the only fragmentary remain of the 32-arch viaduct built in 1805 to carry a branch of the MCC's tramroad across the Ebbw Valley flood plain. Constructed by John Hodgkinson of red pennant sandstone, redundant by 1859 following opening of the Sirhowy Railway, and demolished 1902. Many local houses have been built from its stone.

EB2: Bassaleg Viaduct *CRW*

EB6 COLLIERS INSTITUTE

ST 223908 ✶ ❑

Brick two-storey structure of 1915, now contains Risca Industrial History Museum, maintained by Oxford House Industrial History Society.

EB7 LIME KILN CROSSING

ST 235913 ✶

Level crossing and signal box on what was originally CC's tramroad , then MR&CC, and now Network Rail's line. MR&CC crossing keeper's hut of c1855. Signal box is GWR gabled-roof design of 1887, brick base to floor and timber above. 29 levers with vertical tappet interlocking.

EB8 MINERS GRAVEYARD, RISCA

ST 234918 ❑

East of Limekiln Crossing and the MCC, an enclosed area containing graves of 40 unidentified victims of the Risca Black Vein explosion of 1860.

EB4: Fourteen Locks *SR*

EB9 COX'S QUARRY, CROSS KEYS

ST 218920 ❑

Substantial pennant sandstone quarry and tramroad complex. Provided much of the building stone for Cross Keys village and local industries.

EB10 TRINITY CHAPEL, PONTYWAUN

ST 221926 ❑

Graveyard contains obelisk memorial to Cwmcarn dam victims, and gravestones of victims of colliery explosions; Risca Black Vein 1860, Abercarn Prince of Wales 1878, Risca North 1880.

EB11 NANT CARN AQUEDUCT

ST 219931 ❑

Built mid-1790s by Thomas Dadford junior, to carry the Crumlin arm of MCC. Parallel and immediately alongside is the bridge carrying the Western Valley Road over the Nant Carn brook. Both were destroyed following the Cwmcarn Dam disaster of 1875 and subsequently rebuilt. The aqueduct now marks the northernmost surviving limit of MCC.

EB12 PONTYWAUN GARDEN SUBURB

ST 223933 ✶

Hillside example of 'Garden Suburb' style, built 1910-20 for officials of the Ebbw Vale Iron Steel & Coal Co. Some sixty semi-detached dwellings arranged around a central circle, with added colour through the varying materials; sandstone, render, slate and tile.

EB13 CWMCARN DAM, MCC

ST 227938 ❑

Earth dam approximately 50ft high impounding water for canal. Breached 14 July 1875 and the ensuing flood took out the embanked canal and Western Valley Road, destroying a flannel mill and cottage, with the loss of 12 lives.

EB14 ABERCARN FURNACE

ST 217949 ■

Recently identified mid-18th century charcoal iron-smelting blast furnace, largely intact, alongside a stream. Two furnace arches are visible, together with the charging house (now a garage). Upstream can be seen the dam and pool that powered the bellows for draught. The furnace, which appears to have been operational c1750-88, is the earliest fairly intact surviving iron furnace in the south Wales coalfield and was described and drawn by Angerstein (1756).

EB15 NAVIGATION COLLIERY

ST 213985 ✶

Although closed in 1967, the buildings remain as the best preserved colliery complex in south Wales. Exhibition design built 1911 for Partridge Jones & Co, all of red brick with yellow brick pilasters. Complex includes two winding houses, fan house, (bent) chimney and workshops. Behind the buildings can be seen the steep incline of Mark Phillips' tramroad.

EB16 CRUMLIN VIADUCT

ST 213985 ✶

Masonry abutments of wrought and cast iron lattice viaduct, carrying NAHR across the Ebbw Valley. Built by T. W. Kennard, 1853-7, demolished 1965. Height 204ft, length seven x 150ft spans plus three subsidiary spans.

EB17 PENYFAN CANAL FEEDER POND, CRUMLIN

SO 195005 ❑

Feeder pond for the MCC, supplying water into the head and basin of the canal at Crumlin.

EB18 ABERBEEG SIGNAL BOX

SO 210018 ✶

GWR Flemish-bond brick of 1892 with 65-lever vertical-tappet frame/interlocking. Horizontal weatherboards.

EB19 MARINE COLLIERY

SO 188042 ❑

An 1893 Hathorn Davey horizontal tandem-compound pumping engine is now plinthed alongside the road outside the entrance to the former colliery site. Cylinders ; 36-inch and 68-inch in diameter and a stroke of 120 inch. Above the cleared site of Marine Colliery is a squat circular brick ventilation chimney and shaft (SO 187037), dating from the 1840s or 1850s and disused by 1876. Cwm village to N a good example of 1890s colliery settlement.

EB20 GARDEN CITY, EBBW VALE

SO 165085 ✶

Small hillside garden suburb development designed 1918 for Ebbw Vale Steel Iron & Coal Co.

EB21 BIG ARCH (NEWTOWN BRIDGE)

SO 169099 ❑

Stone-built arch, dated 1813, carrying the Trevil Tramroad (limestone) to the top of the iron

EB15: Crumlin Navigation Colliery *TWE*

furnace bank ¼ mile to the south east. Surmounted by later (mid-19th century) pairs of brick arches carrying the modern road.

EB22 EBBW VALE 'UPPER' IRON FURNACES

SO 172099 ❑

Stone furnace bank containing the remains of five, and possibly six, blast furnaces built 1790-1810. Arches dated 1812 and 1868; the latter date referring to the more modern furnaces built in front of the old ones, which were demolished c1920. The loading platform survives.

EB23 EBBW VALE STEEL WORKS

SO 172093 ■

Developed out of the iron works established 1790 by Watkins, Craycroft & Homfray, incorporating the Victoria Ironworks, one mile down the valley (1838). Taken over by Harfords of Bristol c1817 but forced into liquidation by their banker's failure in 1842. Purchased by Darbys of Coalbrookdale and extensively modernised for steel production 1868-80. Early 20th century decline was halted in 1935 by purchase by Richard Thomas & Co and complete reconstruction into integrated blast furnace and stripmill complex. Steelmaking ceased in 1970s and final closure came in 2002, when the shut down of the tinplate plant (finally owned by Corus) marked the end of over 200 years of iron and steel making in Ebbw Vale. The impressive offices (built 1915) and clock tower remain alongside Steelworks Road, south of Big Arch, together with Ebbw Vale House, the former ironmaster's residence.

EB24 ROUNDHOUSES FARM NANTYGLO

SO 189103 ■ ✶

Two defensive towers, built c1816 by Joseph Bailey of Nantyglo, said to be for key workers in times of industrial unrest, and having slit windows and stout doors. Like the walled farmhouses they have cast-iron window frames, roof trusses, beams and floor joists. To the S between SO 196084 to SO 198074 are fine examples of Blaina Ironworks' housing and at SO 206085 Cwm Celyn Ironworks' pond.

EB25 BRYNMAWR

SO 191116

Started in the 1830s as a dormitory town for Nantyglo Ironworks, laid out around the tramroads. From the 1840s on a regular grid was adopted at the insistence of a local Public Health official. Church only arrived in 1890s, the centre being populated with chapels.

EB23: Ebbw Vale Steelworks offices *CRW*

EB26 BRYNMAWR RUBBER FACTORY BOILER HOUSE

SO 182120 ✶

This is the last surviving fragment (at present derelict) of Brynmawr Rubber Factory, designed for Enfield Cables Ltd by the Architects' Co-Partnership and engineers Ove Arup, and built 1948-52 – an icon of modern industrial design. The structure is covered by an inverted parabolic concrete roof. It originally contained a spiral steel staircase unsupported by a central column.

EB26: Brynmawr Rubber Factory Boiler House *CRW*

S1 PENLLWYN TRAMROAD BRIDGE

ST 215916 ❑

High level (50ft clearance) stone bridge, single span, c1820, brick reinforced c1870, carrying Penllwyn Tramroad over River Sirhowy to its connection with the MCC's tramroad at Nine Mile Point.

S2 NINE MILE POINT

ST 215916 ❑

Former colliery site (1906). The name derives from the distance from the MCC's basin at Newport. The extra mile over the statutory 8 mile limit because of the interruption of the Park Mile Railway at Bassaleg.

S3 PONT GAM (CROOKED BRIDGE), YNYSDDU

ST 179942 ✶

Early 19th century single span stone bridge over Sirhowy R. Carried Penllwyn Tramroad, Nine Mile Point to Blackwood.

S4 WYLLIE COLLIERY BATHS

ST 176943 ■

Dating from 1926, the surviving remains of the last deep pit to be sunk in the Gwent Valleys. Now in light industrial use.

S5 GELLIGROES MILL

ST 177947 ■

A working corn mill with its overshot waterwheel outside. A mill was built in c1625 but what of the present two-storey and single-storey building dates from when is not known.

S6 OAKDALE

ST 186984 ✶

Housing built 1909-24 for colliers at nearby Oakdale Colliery, opened in 1910 by TICC. Six hundred and sixty houses in curved terraces intersecting a straight spine road all on a hill-top plateau. Central Institute now removed to Welsh Folk Museum leaving a sad void. Hotel and places of worship part of original formal layout. An element of Edwardian Garden City movement in Britain.

S7 BEDWELLTY CHURCH

SO 166003 ✶

St Sannan, 13th century, was a huge parish. As a result early ironmaking personalities lie buried here, the pathway to the porch including 18th century iron grave markers marked Merthyr Tydfil village.

S8 HOLLYBUSH COKE OVENS

SO 165035 ■

Early 19th century beehive coke ovens alongside Sirhowy Tramroad.

S9 PONT GWAITH YR HAERN

SO 164043 ✶

[Translation 'The Bridge Iron Works'] Vestigial remains of pre-1700 charcoal iron furnace, lime kilns and foundry. Measured when derelict in 1831; 10ft across base. Appears to have ceased production c1760.

S10 TREDEGAR

Created as a plantation on land owned by the Morgan family of Tredegar House Newport, from whence comes its name. This makes it a somewhat different valley-head settlement. An ironworks was set up from 1799 and the TICC were very successful in moving into coal sales, owning a large number of collieries.

The initial partnership involved the elder Richard Fothergill and Matthew Monkhouse of Sirhowy

S10: Tredegar Town Clock *TWE*

Ironworks, plus the elder Samuel Homfray and William Thompson and William Forman of Penydarren Ironworks at Merthyr Tydfil. Their chosen site ws 1 mile S of the Sirhowy works. Trading was as Samuel Homfray & Co. to become TICC. Homfrays pulled out in 1868. This signalled an acquisition by Manchester interests, Lord Aberconway with Joseph Whitworth and Henry Pochin being involved.

Iron was first produced in 1802 from two furnaces. All puddling, forging, and rolling was performed on the same site. 1881 saw a Bessemer plant constructed, but despite modernisation all but one mill were silent in 1892. With dismantlement the mills remained and until 1940 TICC produced colliery items in one of them. The remaining mills were leased by the go-ahead L. D. Whitehead, a name much associated with Newport.

SHOP ROW (SO 143089) is the former company shop of TICC. Dominating the town centre, the **TOWN CLOCK** (SO 142088) is a 72ft high cylindrical cast iron tower topped by a four-sided clock. Cast 1858 by Jordan of Newport.

S11 BEDWELLTY HOUSE

SO 142086 ❑

Now council offices, the home of Samuel Homfray, ironmaster of Penydarren 1800-c1830, best surviving example in Gwent of an ironmaster's house. In the grounds, now a public park is a collection of mining artefacts, and a 15 ton block of coal cut for the Great Exhibition of 1851, but which proved too difficult to transport.

S12 TREDEGAR CHOLERA CEMETERY

SO 139079 ❑

Hilltop cemetery at Cefn Golau, for victims of 1847-9 cholera epidemic, set apart from the main cemetery. A few gravestones remain standing.

S13 SIRHOWY IRONWORKS

SO 143102 ✶

On the E bank of the Sirhowy the site of the earliest coke-fired furnace in Monmouthshire of 1778.

S14: Dukestown Viaduct *TWE*

Blast was produced by waterwheel, a second and third furnace of 1797 and 1801 being both blown by steam power. The enterprise was started by a bevy of beverage providers - namely John Sealy and Bolton Hudson, grocers and teamen of London; Thomas Atkinson of Yorkshire, a merchant, plus William Barrow of London, a grocer and teaman. 1818 saw takeover by Ebbw Vale leading to construction of a 1½ mile long tunnel between the sites.

Metal-clad furnaces in the late 1880s sat in front of the original masonry retaining wall. As a result a mixture of 18th century masonry and 19th century extensions is to be observed with two identifiable furnace portions and a bear. A large Sirhowy Tramroad bridge leads to the works - at one time carrying a fan of rails. This tramroad connected over the 32 mile to Newport (Pillgwenlly) and the Usk. Several boundary markers and stones in the vicinity.

S14 DUKESTOWN VIADUCT

SO 133109 ✶

Curved and rising with round-headed arches across the infant Sirhowy. By John Gardiner in 1864 for the MT&AR in masonry with brick soffits and inverts. Known as the Nine Arches.

BRECKNOCK & ABERGAVENNY CANAL TRAMROADS

1. Northwards: All carrying coal, coke, lime and general trade goods into the agricultural region of the Borders.

Hay Railway: A 24 mile long 3ft6in plateway from Brecon Watton wharf to Eardisley in Herefordshire where an end-on connection was made with the Kington Railway. This latter ran to Kington (1820) and Burlinjobb Limeworks, Radnorshire (1825). Largely closed 1860.

Watton Plateway: A 1 mile long plateway from Brecon Watton wharf into the town. Opened 1816-18. Date of disuse unknown.

Glangrwyney: 1½ mile edge-rail system, later plateway. From Gilwern wharf to forge on north bank of River Usk to transport pig. Mostly closed pre-1833 and totally by 1908. SO 244145 to SO 239162.

Llanvihangel Railway: A 6½ mile route of 3ft6in plateway opened in 1814. With a continuous route to Hereford through end-on junctions, the Grosmont Railway (below) and Hereford Railway (also below) were particularly busy suppling coal to that city. Abandonment was in 1846. Govilon wharf SO 269138 to north junction at SO 327207.

Grosmont Railway: Opened 1818-19 from Llanvihangel to Llangua as 3ft6in plateway. At Monmouth Cap, the site of the end-on junction with the Hereford Railway the tram road stables survive. The name of the location comes from the necessary tavern at the horse-changing point and commemorates the County's long-time major industry. (Monmouth School in the historic County town is a Haberdasher's foundation.) SO 327207 to SO 264394.

2. Southwards: Carrying iron products, coal, coke to the canal for loading and fuel to the canalside limekilns.

Craig-yr-Hafod: At Llanover, a 3ft plateway to limestone quarries. No date. Steep 2¾ mile looping route from wharf at SO 301097 to limekiln and then quarry at SO 273103.

Hill's Tramroad: 5 mile long 2ft gauge plateway opened 1825. Extremely spectacular with two huge inclines and an equal number of tunnels. Connection from BICC's Garnddyrys Forge to Llanfoist wharf. SO 285130 on canal to SO 258118.

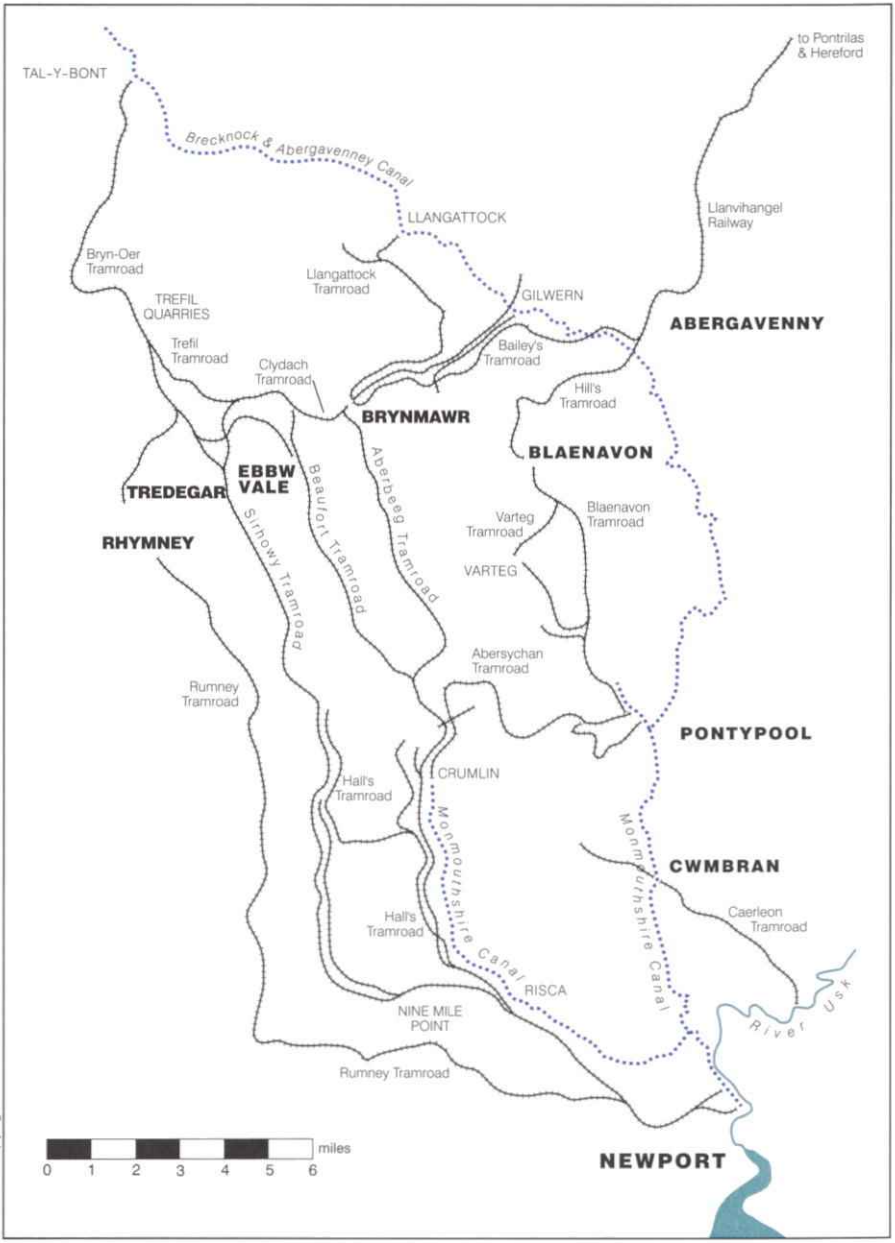
Bailey's Tramroad: A 5½ mile plateway line of 4ft4in gauge, from Govilon to Brynmawr and on to Nantyglo. Opened in 1822 to carry coal and iron and named after Crawshay Bailey its owner. cSO 190110 at the furnaces to SO 270137, the wharf.

Llammarch tramroad: Plateway, gauge not known, of 1795 from several lime and coal works at Llammarch to provide for Clydach Iron Works (substantial remains at south). Extended 1803 to Gilwern wharf on canal. Route lay on south of Clydach Gorge, the mineral workings being at SO 219121 with unloading facilities at SO 244145.

Beaufort: 5¾ mile route to Gilwern from Beaufort through Brynmawr and opened 1795 on edge-rail. Later conversion to plate-rail and then back to edge-rail. Owned by BAC. Ran on north side of Clydach Gorge. Closed 1860 above Brynmawr, remainder 1908 after a lifetime carrying pig and coal.

Langattock: A 2 mile limestone-carrying plateway opened post-1816 by BAC. Connected Daren Cilau quarries to Llangattock wharf. Closed 1911. Wharf and kilns at SO 207173.

Bryn-Oer Tramroad: This 3ft6in gauge plateway was opened in 1815 and ran for 12 miles joining Rhymney Ironworks and Trevil quarries for the purpose of coal, pitwood and lime transport. It closed in 1865 and was a brainchild of the renowned Benjamin Hill. Works at SO 112074 to canal at SO 114225.



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U1 CAERLEON BRIDGE

ST 342903 ✶

1806-12 by David Edwards (of the Pontypridd bridge family). Three arches but not visually improved by subsequent widening. Newport District Toll house at bridge in a Tudor style

U2 NEWBRIDGE-ON-USK, TREDUNNOCK

ST 385948 ✶

Three segmental arches of 1779 across the Usk and another effort from the Edwards family. An extremely beautiful design enhanced by the use of Old Red Sandstone in its construction.

U3 USK BRIDGE AND TOLLHOUSE

SO 374007 ✶

Five segmental arches, built in 1750 and widened in 1836 Claimed to be a design of William Edwards.

U4 PRIORESS MILL

SO 367023 ❑ (rarely)

House and two-storey corn mill group dating from 16th century, with an external waterwheel operational and infrequently used. Owned by County Council and is within Usk Agricultural College grounds.

U5 GOYTRE WHARF, BAC

SO 057315 ❑

This section of canal was constructed 1809-12 by William. Crossley and the buildings at the wharf are contemporary. The canal is embanked across a low depression through which runs a substantial limestone aqueduct. Alongside this is a one-up, one-down cottage which served as wharfmaster's office. Running off the canal to the north is a loading dock below which is a stand of three limekilns charged directly from narrow boats. A substantial manager's house is at the site entrance.

U6 PONT-Y-GOITRE

SO 348089 ✶

Very stylish stone bridge of three spans, the central one of 58ft. Mason John Upton of Gloucester. Pantygoitre house to S is 1776 and 1820s and reputed to have been a fishing-lodge for the Crawshay and Bailey families.

U7 LLANELLEN BRIDGE

SO 306111 ✶

By John Upton of Gloucester in 1821 and of three segmental arches.

U8 ABERGAVENNY SIGNALBOX

SO 306133 ✶

GWR horizontal-boarded wooden box of 1934. 52 levers with tappet interlocking.

U9 ABERGAVENNY STATION

SO 305136 ✶

By Charles Liddell for NA&HR in 1854. Attractive Italianate main block in sandstone, with original low-level platform entrance on rail side.

U10 ABERGAVENNY BRIDGE

SO 292139 ❑

Spanning the River Usk, the bridge carries the A4143. Stone-built, it is a composite structure of three periods. The downstream arches and piers belong to the 15th century bridge, whilst those upstream are part of a tramroad bridge (1811) carrying the Llanfihangel Railway from the canal at Llanfoist. The roadway and parapet date from 1868 when the two bridges were combined. Immediately north of the bridge are the surviving abutments of the railway bridge (1862) carrying

U5: Goytre Wharf, BAC *CRW*

U9: Abergavenny Station *TWE*

U11: Llanfoist Wharf, Brecknock & Abergavenny Canal *CRW*

the MT&AR line across the Usk towards Merthyr Tydfil.

U11 LLANFOIST WHARF, BAC

SO 285130 ❑

Wharf and wharfmasters house with warehouse, constructed by Hills of Blaenavon Ironworks, c1817-19. Aqueduct with tunnel carrying parish road from Llanfoist to the Blorenge. The wharf was fed by a steep chain-worked incline bringing Hill's Tramroad down from the Blorenge. Overbridge carrying Hill's Tramroad over the canal, down a further incline to link with the Llanfihangel Tramroad. Winding hole on canal, built illegally by Hills.

U12 LLANFOIST CHURCHYARD

SO 286132 ✶

Church is old but restored by Bailey family. Tall granite pillar marks grave of Crawshay Bailey d.1872. Others buried there include the experimental chemist Baldwyn, Robert Wheeley d.1855 work's manager, and members of the Steel family of surgeons and apothecaries, all of whom served the BICC. Close-by is Llanfoist House the one-time home of Crawshaw Bailey.

U13 GARNDDYRUS FORGE

SO 258118 ❑

Opened by Hills of Blaenavon in 1817, Garnddyrus Forge straddles the spectacular route of Hill's Tramroad and the B4246. The site contained puddling furnaces and a rolling mill to produce wrought iron from Blaenavon pig-iron. Closed in 1860, the site had a population of approximately 450 in the 1840s. Only earthworks and two empty reservoirs remain, with the foundations of workers houses excavated in 1970.

U14 CLYDACH RAILROAD

SO 225130 ❑

Constructed 1794 by Thomas Dadford as a horse-operated edge railway linking collieries and ironworks at Beaufort with Glangrwyne Forge on the Usk (SO 241162). Much of this tramway is now under minor roads, particularly the lane running from the canal wharf at Gilwern to Maesygwartha.

U15 LLANELLY FURNACE

SO 232138

There are reports of an iron furnace here as early as 1590, replaced in 1606. The present remains date from about 1684 but went out of use in the second half of the 18th century. The charging bank and part of the charging bridge are visible, and above them the site of the charcoal store. Behind is a large bank of limekilns. The remains of Llanelly Forge (SO 236140) are lower down the valley.

U16 GOVILON WHARF, BAC

SO 274138 ❑

On the wharf is Bailey's iron warehouse (now BWB Regional Office) built 1821 to service the tramroad from Bailey's Nantyglo Ironworks. (This tramroad reached the canal two miles nearer Newport than the earlier Clydach Tramroad at Gilwern.) It connected with a short branch of the Llanfihangel Tramroad, which ran up the north east side of the canal from Llanfoist. There are lime kilns built into the canal bank south of the wharf, whilst the north end is spanned by a stone/brick built skew bridge of the LNWR (c1862).

U17 GILWERN CORN MILL

SO 246149 ■

Early 19th century, on bank of R Clydach, alongside Gilwern embankment, originally with under-

U20: Clydach Ironworks
TWE

shot wheel. Has been a private house for some years but much of the mill machinery is preserved in the building.

U18 DAN-Y-BONT WOOLLEN MILL

SO 246147 ✶

Narrow three storey 19th century building of rubble stone with adjoining owner's house now converted to private house. Original overshot wheel no longer present although leat from R Clydach can be seen. Alongside is a contemporary stone single arch bridge over river.

U19 GILWERN EMBANKMENT, BAC

SO 243146 ❑

This 80ft high embankment, effectively spanning the Clydach Gorge, carries the BAC over the River Clydach. Through the centre runs a branch of the Clydach Railroad, connecting the various ironworks to the west, with the much earlier Glangrwyne Forge on the east bank of the Usk. Completed in 1792, it is the major structural work of the BAC, and formed its southern extremity until its extension south to link with the MCC at Pontymoile in 1812.

U20 CLYDACH IRONWORKS

SO 230132 ❑

Two square blast furnaces constructed 1793 and 1797 a third (circular) 1826 and fourth, 1842. The site was excavated and remains of three furnaces and one charging house, together with the pit for a 42ft diameter cast-iron water-wheel are exposed. South of the furnaces is an inclined plane (counter-balanced) enabling iron to be carried to rolling mills at a higher level. By 1841 the works employed over 1,350 hands but ceased production in 1877. Access to the site is by way of Smart's Bridge, a cast-iron structure of lancet tracery dated 1824, spanning the River Clydach.

U21 BAILEY'S TRAMROAD BRIDGE

SO 259133 ✶

A fine round-arched stone bridge with high curved causeway on W approach. Built 1821 to carry 4ft2in route from Nant-y-Glo Ironworks to Govilon canal wharf.

U22 LLANGATTOCK QUARRIES

SO 200160 ❑

Extensive limestone quarries running for some 3 miles along the north facing Llangattock escarpment at 1,100 to 1,300ft above sea level. Developed c1799 with the opening of the BAC, with a tramroad linking the two built in 1816, via a balance worked incline.

A further tramroad built in 1825 by Baileys followed the 1,300ft contour southwards to supply limestone to Nantyglo Ironworks.

Below the limestone strata, at approximately 800ft, was a sandstone quarry supplying block, flagstones and lintels.

U23 LLANGATTOCK WHARF AND TRAMROAD

SO 237177 ❑

A tramroad was built c1816 by the Brecon Boat Co from the Darren Quarries (on the Llangattock escarpment) to Llangattock Wharf. This included a double balance-worked incline descending 800ft in half a mile. At the same time two stands of limekilns (one now demolished) were built, with a wharf master's house. Coal for the kilns was brought up the canal from Gilwern. In 1828 Baileys of Nantyglo Ironworks constructed an iron wharf alongside the existing wharf, and a bascule bridge

U22: Llangattock Quarries
TWE

(now demolished) was built alongside bridge 114, to a coal yard and chain-forge on the east bank of the canal.

U24 CRICKHOWELL BRIDGE

SO 215181 ❑

The earliest record of a bridge is a survey of 1538. The present structure, the longest stone bridge in Wales, dates from the late 18th century. It is unusual in that, when the 'inner bypass' of the town was built in 1828-30, the bridge was modified to contain 13 arches on the upstream side and 12 on the downstream side.

U25 LLANGATTOCK CHURCHYARD

SO 178211 ✶

Contains many interesting tomb-chests and slabs telling of the 'great and good' of Beaufort Ironworks.

U26 ASHFORD TUNNEL, BAC

SO 123215 ❑

The tunnel is situated one mile south of Talybont-on-Usk, alongside the B4558. It is 375 yards long, with one ventilation shaft, and is of cut-and-cover construction. In normal circumstances an open cutting would have been used but the ground was so unstable that a tunnel was substituted.

U27 TALYBONT RESERVOIR

SO 100190 ❑

The main water supply to Newport, its final phase, completed in 1939, comprises a reservoir 2¾ miles long by 500 yards wide, impounded behind a 50ft earth and clay dam. There is a treatment works on site. The east side of the reservoir is skirted by the trackbed of the B&MR, running down the valley from its summit at Torpantau. On the hillside above the B&MR trackbed ran the Brinore Tramroad (1815), from Trevil Quarries (SO 120130) to BAC at Talybont (SO 115226). It also extended southward to Rhymney (SO 116070) and Llechryd (SO 110091) providing an outlet for iron.

U28 BRYNICH AQUEDUCT, BAC

SO 083258 ❑

Four-arch stone aqueduct, 80 yards in length, spanning the River Usk below Brynich lock. Extensively restored in 1996.

U29 BRECON WHARF, BAC

SO 048282 ❑

The northern terminus of the canal. Little remains of the original basin, which has been extensively redeveloped for leisure boating use.

U30 GRWYNE FAWR RESERVOIR

SO 230308 ❑

Dam and reservoir built between 1911-28 to supply water to Abertillery. Tallest dam at 173ft (stone built) in UK. Mean reservoir height 1,725ft above sea level with a switchback 22 mile main to Abertillery and Cross Keys. The contractors' 3ft gauge railway from Llanfihangel Crucorny (trackbed still visible) operated the highest adhesion traction railway in the UK, rising to 1,800ft. Village was at Blaen-y-Cwm (SO 253284).

Iron has been worked in the Pontypool area since Roman times, but developed in the late 16th century with the acquisition by Richard Hanbury in 1578 of a small existing iron works, for the production of Osmund Iron. The major advance in 1700 was construction of the world's first water-powered rolling mill, enabling the mass production of cheap, high quality and consistent sheet black plate iron. By the mid 18th century, with the development of tin plating, the ironworks became one of the most important in Europe.

An offshoot of production of rolled iron was a lacquering process (which became redundant on the introduction of tin-plating) from which came a japanning process, introduced by the Allgood family. Pontypool Japanware (emulating in metal fine Japanese lacquer work) was produced as a cottage industry from 1730 to 1820. The Hanbury ironworks survived in the control of the family until 1860 when, overtaken by larger more modern plants, it was absorbed into the Ebbw Vale Iron & Coal Co.

In the 19th and through to the mid-20th centuries there was extensive steel, iron and tinplate production in and around the town, together with many collieries, all now gone.

AL1 PONTHIR

ST 334920 ✶

Stone bridge over Caerleon Tinplate Works leat and Caerleon Tramroad. On Pontypool turnpike.

AL2 CWMBRAN

In 1949 approximately 3,000 acres was designated as Wales' only new town under the New Towns Act of 1946, set around an existing 19th and early 20th century settlement based on coal, iron, tinplate and brick production with an existing population of 12,000. Construction commenced in the 1960s and impetus for early development was to provide housing for the 15,000 workers at the new steelworks at Llanwern [MC4], near Newport. The majority of those jobs have now gone, but the town remains a centre for a wide range of light industries, particularly electronic and automotive, and is still home to Avesta Steels, specialist electrical steel producers on the site of the former Panteg Ironworks (ST 298981).

AL5: Hafodyrynys, slime thickener *CRW*

AL3 BRITISH NYLON SPINNERS

SO 307025 ✶

Now a production plant for Dupont, built in 1947 for British Nylon Spinners for production of nylon yarn, and research and development in man-made fibres. Main feature is the massive steel, brick and glass 'spinning tower'. Taken over by ICI in 1962, the research facility was transferred elsewhere, and the extensive buildings sold off for a variety of uses, leaving the production unit as it is today.

AL4 LITTLE MILL JUNC. SIGNAL BOX

SO 315023 ✶

McK&H (GWR) of 1887. 17 levers with vertical tappet interlocking.

AL5 HAFODYRYNYS SLIME THICKENER

ST 243990 ✶

A concrete drum set on short legs and roofed with a domed concrete cap. Remnant of the washery of Hafodyrynys Colliery - an expensive scheme of 1954-58 involving two new drifts and underground links to other pits allowing outputs to be concentrated at fewer places with modern plant. Closed 1966.

AL6 LLANDEGFEDD RESERVOIR & DAM

ST 330995 ✶

Constructed with earth dam, masonry inner face, completed c1960 for Cardiff City water supply and, in particular, Spencer Steelworks, Llanwern [MC4].

AL7 GLYN PITS

ST 266998 ✶

At present scaffolded and strutted - do not enter the fenced area.

A colliery sunk by Capel Hanbury Leigh to provide

AL7: Glyn Pits. *CRW*

for his Pontypool Iron and Tinplate works. Two fine engine houses, both containing their engines. The older, carrying an 1845 date, has an integral lattice ironwork supporting the beam engine, both being designs of the Neath Abbey Ironworks. Substantial pumping and winding remains - flywheel, crankshaft, gearing, sheaves and pump-rods. On the opposite (E) side of the two masonry-lined shafts, with T-bob, pump-rods and fan drift is the later engine-house. This huge structure contains a (second-hand?) vertical engine of unknown manufacture, dated 1859-65 by RCAHMW. The winding sheaves and some of the brake mechanism remain, as do wire ropes. Boiler-water reservoir at rear of site.

At Upper Race ST 285984 (Open) a vast hushing, with easily traceable water-channels and ponds above. Also 1 mile long water feeder from Blaen-Bran ponds at ST 267972.

AL8 CANAL TOLL COTTAGE, PONTYMOILE BASIN

SO 294003 ❑

Situated at the end-on connection between the MCC and the BAC (later amalgamated), this bow-fronted cottage is positioned above an embankment to give a clear view in both directions. Dated c1812 it is alongside a stop-lock where tolls were collected. An arm of the MCC (closed c1850) ran north-west from here to Pontnewenydd. Nearby (to the north) is a substantial aqueduct over the Afon Llwyd and two tramroad tunnels beneath the canal.

AL9 PONTYPOOL PARK

SO 290010 ✶

Seat of the Hanbury family, now a school. Dating from 1689 but subsequently modified over the years up to 1872. The stable block, built 1831 around a cobbled courtyard, now houses Torfaen Museum. At SO 290005 are early 18th century wrought-iron gates (with later, 1830, vine-leaf decorated cast iron pillars by Thomas Deakin of

AL7: Glyn Pits beam engine *TWE*

Blaenavon). The gates were a gift to John Hanbury, of Pontypool Ironworks, by the first Duchess of Marlborough, as a token of thanks for acting as executor to the first Duke, John Churchill.

AL10 PONTYMOILE FOUNDRY

SO 289002 ✶

Typical mid-19th century foundry building with open yard at front, stone built with circular ventilation windows in gable end. There are gateposts in the vicinity carrying the foundry name.

AL11 GRIFFIN PRESS BUILDING

Osborne Road, Pontypool

SO 288005 ■

Five-storey stone-built printing works, built 1870 on steeply sloping site. Ceased operations 1988, now converted into apartments.

AL8: Pontymoile *CRW*

AL12 CWM FFRWD-OER VIADUCT

SO 262018 ❑

MR&CC four-arched viaduct on a very sharp curve and climbing at 1 in 48. Opened 1879 to Talywain (Abersychan).

AL13 CWMBYRGWM COLLIERY

SO 250034 ❑

Presumed sunk in the 1840s by British Iron Co. for ironstone and coal. A brick-lined oval shaft with a timber dividing beam at its head. This was a water-balance pit and the surface gear was dismantled for restoration. Work was never completed and some of the remains lie scattered about the site. A disgraceful attitude towards a once important South Wales technique.

Nearby is Red Ash Colliery Engine House (SO 251034), a tall and slim brick building of around 1900. To S head-frame feet with horizontal engine bed and probable powder store.

AL14 BRITISH IRONWORKS

SO 259035 ❑

The British Ironworks (1827-83) was built to the design of Decimus Burton. There were four furnaces, of which only the bases survive, with coke and calcining ovens. The office block survives, now roofless, as does the beam engine pump house of 1845, and its chimney base, from the British Ironworks Colliery. The site is approached through 'Big Arch', an impressive 50-yard, 48ft wide tunnel beneath the MR&CC embankment of 1879. One mile north west of the ironworks site is a substantial earth and stone faced dam containing a reservoir for the works.

AL15 LASGARN WOODS

SO 275040 ❑

Wooded hillside approximately 1½ miles by ½ mile, containing limestone quarries and an extensive network of early to mid-19th century tramroads.

AL16 GARNDIFFAETH VIADUCT

SO 262043 ❑

Masonry, of nine arches with brick trimmings and both curved and inclined. Built by LNWR on Abersychan-Brynmawr line, opened 1877.

AL17 VARTEG HILL INCLINE

SO 267060 ✶

Railway (as opposed to tramroad) incline approximately one mile in length, used to lower 10-ton coal trucks from Varteg Hill Colliery to MR&CC at Cwmavon. In use c1850 to c1880.

AL24 BLAENAVON TOWN

Blaenavon Ironworks, founded in 1789, is now regarded as the best preserved ironworks of its type in the world. The whole surrounding landscape once controlled by the iron company is now a World Heritage Site. The town of Blaenavon began as a cluster of houses and other buildings built by the iron company near the works and alongside their tramroad down the valley. Only later did a town centre grow up, sited on a few parcels of land which the company did not control. Features typical of ironmaking towns at the heads of the South Wales valleys can be seen - terraced houses, shops and pubs, churches and chapels. Downhill from the Ironworks, the Blaenavon Railroad, opened in about 1795, is marked by the curving main road. On its left a high wall encloses Ty Mawr, a mansion built for a partner in the ironworks around 1799. Beyond this on the right are the little gothic works school opened in 1815 (the oldest surviving in Wales), the church built by the ironmasters in 1804, and the vast Workmen's Hall of 1895. Broad Street, rising up the hill, was in 1840 still an 'intended street', with a brook alongside, but by the 1860s it had become the thriving, gas-lit hub of the evolving town, with pubs, chapels and some eighty shops selling all the goods that the community needed.

AARON BRUTES BRIDGE

SO 248088 ❑

Tramroad bridge. Cast-iron beams supporting a wrought platform for decking and connecting eponymous ironstone level of c1800 to original works.

COITY HOUSE

Forgeside

SO 243087 ■

BICC manager's house of 1860. In use as offices up to 1990 by Daniel Doncaster Co. Known as the 'White House'.

FORGESIDE ✶

Still involved with metals in that Daniel Doncaster's use the works site to manufacture aircraft engine components, mainly using titanium. Some BICC forge buildings remain. Early 20th century red-brick generating station at SO 243087 (✶). Three (of five; A to E Terraces) surviving brick rows, some now rendered, plus 'Coity' Terrace' thought to be the first housing here.

Forgeside School SO 245086 has more recently been an inn.

AL18 CWMAVON BREWERY

SO 270063

A 5-storey tower brewery built in 1900 for Westlakes of Blaenavon. Currently a plastics factory, the whole complex including manager's house and offices has been sympathetically restored externally in recent years. Pennant sandstone construction dressed with red brick, located alongside the Afon Llwyd to take advantage of the water supply.

AL19 DOG STONE

SO 255065

Cast-iron marker on Varteg Hill commemorating the occasion when T. W. Kennard (builder of Crumlin Viaduct) accidentally shot his favourite dog, Carlo.

AL20 CWMAVON HOUSE

SO 270067

Built for the forgemaster of Varteg Forge c1830, a fine late Regency house, two storeys under a hipped roof.

AL21 FORGE ROW, CWMAVON

SO 270067

Built c1804-06 for workers at the nearby forge, a terrace of twelve very small cottages, each only a door and window wide. Restored to a high standard in 1986-7, as six houses, with white walls and earth-coloured doors and windows.

AL22 BLAENTILLERY No 2 DRIFT

SO 235082

A working mine, all within a huge modern shed, hidden from the town below by an earthen bank, a particularly bizarre idea in this historic mining centre.

AL23 COITY SANDSTONE QUARRY

SO 233083

Quarry dating from the 1840s, provided much of the building stone for the town of Blaenavon. Stone was taken down an inclined tramroad (running more or less through the existing Big Pit site). At the incline head, inside the quarry, is a large (approx. 8ft diameter) braking drum for balanced working. This is in a good state of preservation.

AL21: Forge Row, Cwmavon *TWE*

GLANTORFAEN HOUSE

Early 19th century dwelling acquired by BICC in 1819, became Vicarage, then manager's house.

HOREB BAPTIST CHURCH

1862-63 designed by local civil engineer and showing the sturdy industrial confidence of the age, both architecturally and in confronting the church opposite.

PARK HOUSE

SO 251090

Lying off Park Street, this was the Hill family home.

POLICE STATION

Church Road View

1867 built by BICC. The style shows.

ST PETER'S CHURCH

SO 251087

Built 1805 and paid for by Thomas Hill and Samuel Hopkins. Cast-iron font and columns supporting galleries. Outside cast-iron tomb chests and railings.

ST PETER'S SCHOOL

Church Road.

Earliest recognised Welsh ironworks school, built for and funded by Sarah Hopkins, Samuel's sister.

TY MAWR

Church Road.

Built around 1800 for Samuel Hopkins. Later Director's house and used for shooting parties (grouse - hence Keeper's Pond).

WOOD LEVEL

SO 248089

Gated and accessible entrance to an example of the fine stone-lined drainage cum walking tunnels under the town. Others are the pre-1840 River Arch Level, Engine Pit Level 1800-10 and Forge Level of 1830. Several connect to Big Pit bottom.

WORKMEN' HALL AND INSTITUTE

High St.

1893-94 and indomitable. 1,500 seat theatre was inside, now scaled down, with reading and recreation rooms.

LANDSCAPE

S from an axis SO 243097 to SO 254103 can be seen four centuries of successive mining upheaval. Early 17th century hushing and associated watercourses segue into 20th century opencast. Fossilised earthworks at their most important.

AL23: Coity Sandstone Quarry *CRW*

AL25 BLAENAVON IRONWORKS

SO 250093 ❑ CADW

First produced iron in 1789 on land leased from Lord Abergavenny. With three blast furnaces there were three West Midlands' partners - Thomas Hill, Thomas Hopkins and Benjamin Pratt. From 1796 the Blaenavon tramroad/MCC route came into being, later joined by Hill's tramroad of 1817-22 northwards to Pwll-du and the BAC at Llanfoist. This later, cheaper route led to the forges' relocation from Cwmavon to Garnddyrys. In 1836 the BICC was formed and Forgeside was created by that Company in 1839 as a new site. Famous for rail production and with the MR&CC arriving in 1854 the works was lifted under T. W. Kennard, chairman, but failed in 1878. That was the year in which Percy and Sidney Gilchrist-Thomas overcame the phosphorous problem bedevilling the Bessemer conversion process. Limestone and coal were comprehensively developed by the company throughout the area and following a fresh life through the steel era liquidation came in 1957.

Now remaining is a classic S Wales hillside works, with charging platform on a terrace above the casting floor allowing easy routing of tramroads and water courses to the top of furnaces. Here two levels emerged into the N bank, one being recognisable left of the water-balance tower.

The range of furnaces have lost their dressed stone cladding, lost to St.James's church in 1914. As it happens, this has revealed their construction superbly. Calcining furnaces above and the monumental balance-tower relate to the hinterland mining and tramroad network. A cast-house (No 2), foundry buildings and an early blast house lie intimately with the 1789-92 dwellings of Stack Square. The pay office, truck shop, storerooms and iron blast-main supports add to the scene.

AL26 BIG PIT

SO 257088 ❑

Present shaft sunk 1860 in an area of early 19th century ironstone and coal mining to supply the then new Forgeside works. Whilst the buildings are architecturally unpretentious, they are exceptional in being the most comprehensive overground and underground layout surviving in Wales; pit bank, steel headframe (1921) and tram circuit, electric winding engine (1952), fan house (1910), workshops, offices, and more. The 1939 baths and canteen, built in the International Modernist style, is one of the best examples anywhere. Coal production ceased in 1980 and the site is now the Welsh Mining Museum and open to the public with underground access.

AL27 GUNPOWDER STORE

SO 246096 ✱

Of 1850s, rubble with brick chamber inside. Has barrelled blast roof.

AL28 HILL PITS

SO 239103 ❑

Sunk 1835 by BICC for ironstone and coal. Also produced sale coal. Horse tramroad, with blocks, leads to incline top at SO 243099. Here are the remains of a horizontal iron band-brake in a stone-lined pit below the crimp adjacent to foundations of stables. At SO 240102 lie the remains of a former collier/farmer's house - Ty Abraham Harry.

AL25: Blaenavon Ironworks *TWE*

AL26: Water Balance, Big Pit *TWE*

AL31: Pwll-Du tramroad
CRW

AL29 HILL'S TRAMROAD TUNNEL

SO 273128. ✶

Deduced to be an early 1820s 'avalanche shelter'.

AL30 PWLL-DU BALANCE POND

SO 253113 ✶

Normally dry. Fed a water-balance shaft in Pwll-du limestone quarry immediately below. This impressive shaft is cut out of the country rock (dangerous). Probably disused by 1880.

AL31 PWLL-DU TRAMROAD TUNNEL

SO 245117 to SO 248098 ❑

1815, a 1¼ mile long 2ft gauge system (later 3ft) involving mining levels (ie. not straight) gave connection between Tyla limestone quarries to the original works and from the works northwards to the BAC. Two entrances at the N end from an underground Y junction. The Dyne-Steel railway inclines SO 242111 to SO 235106 were steam-powered and by-passed the inevitable tunnel bottleneck. Had four rails, traffic being S to N. Pond for boiler water at summit.

AL32 PEN-FFORDD GOCH OR KEEPER'S POND

SO 255109 ✶

At 1,500ft above sea level. Connected by leat north to Garnddyrys forge.

AL16: Garndiffaeth Viaduct
TWE

WYE NAVIGATION

For some ten mile upstream from Chepstow the river is tidal and it flows through a spectacular gorge as far as Tintern. Only above Tintern are the banks truly accessible, even then being steep. Navigation was possible as far as Hay-on-Wye and for a longer period to Hereford. It should be remembered that this was at a time of higher rainfall than nowadays and that the huge extraction of water by the Birmingham Corporation Elan and Claerwen schemes now much reduce the Wye flow.

In order to lessen dependence on Continental manufactures, the Government in 1565-66 surveyed possible water-powered sites for wire production. The Angiddy tributary at Tintern was selected and started with brass wire, soon replaced by Osmond iron obtained from Monkswood, Usk. The Company of the Mineral and Battery Works of 1568 (a Government institution) worked here until 1631. Eight separate sites worked for three centuries with inevitable ups and downs and changes of product. As a final act the new WVR of 1875 built a railway bridge across the Wye to Lower Wireworks. Despite this and a conversion to tinplate working in c1880 the Angiddy valley was peaceful by 1900.

W1 CHEPSTOW

Since Norman times a maritime and estuarial centre. Its Marcher privileges and border position led to huge trades, both legal and illegal. River frontage still has some warehousing and slips with interesting 'back-up' industries further into town. Offices of E. Finch still stand, the products of that foundry are to be found over a wide area; headframes to bridges and much else. Their legacy survives in the Fairfield-Mabey works at ST 538936. Local 20th century crossings of Wye and Severn carry their name.

Less successful was the National Shipyard No 1 started in 1915 by Lord Inchcape and Partners. The yard worked from 1918-25. Steel-clad shipbuilding sheds and eight concrete slips survive. Bulwark housing estate was built for the anticipated 8,000 people expected, including 6,000 soldiers. Hardwick Village is later workers' housing. National shipyard No 2 was opposite on the Gloucestershire bank of the Wye at Beachley, now an Army Training School.

W2 CHEPSTOW OLD BRIDGE

ST 536943 ❑

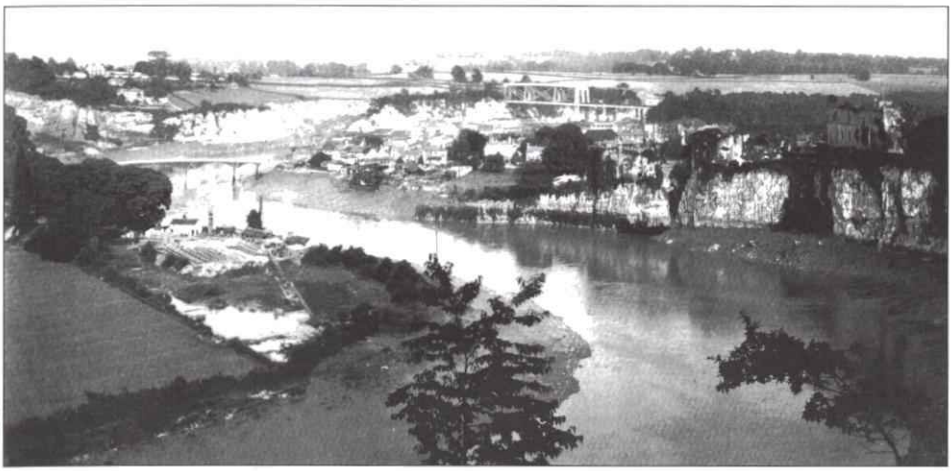
Elegant five-arch cast-iron bridge of 1816. Made at Bridgnorth Foundry by J. Hazledine and designed by John Rastrick. Strengthened 1889.

W3 CHEPSTOW RAIL BRIDGE

ST 539941 ❑

Brunel's SWR 1852 tubular suspension bridge was replaced with a welded truss in 1962. Original concrete-filled cast-iron piers and masonry works survive. A section of tube is to be found displayed at the entrance to Fairfield-Mabey Engineering's yard.

below: W2 & W3: The river and bridges at Chepstow *CRW*



W2: Chepstow Old Bridge *TWE*

W4 CHEPSTOW RAILWAY STATION

ST 537937

Smaller example of Brunel-style Italianate pavilion on northbound platform. Single-storey with overhanging platform awning. Spoilt by egregious modern roof. Footbridge components made by the Finch Foundry.

W5 CHEPSTOW STEAM CORN MILL

ST 537938 ✶

Built in 1851 adjacent to the broad-gauge SWR and with a direct siding into the middle-storey, this was an enterprise of one Robert Sharpe who was engaged on the Wye bridge construction for the railway. As Chepstow had no bulk export capability ie. coal, grain ships had to move elsewhere to load and the mill was never a success. Two malting kilns at the N end date from conversion to a maltings during the 1890s. Burnt out in 2002.

W6 LOWER OR ABBEY FORGE

SO 529002 ❑

The main road crosses the dam for the works with the floating harbour immediately below. This was the site of a tidal waterwheel. Abbey Mill lies on the site of the forge and was a corn mill and later sawmill. A blast-furnace and forge were known here by 1633, constructed by the Earl of Worcester, the furnace superceded by the Abbey Tintern furnace built by 1669. Workmens' cottages W of the dam bridge.

W7 MIDDLE CHAPEL WIRE MILLS

SO 521002

Served by a 3,100ft leat (dry) from below Tilting Mill pond. Middle Mill is rubble but the tail water went to another portion of the works at Crown Cottages - the name relating to the Government involvement. Chapel House seems to be the modified mill building, corn and oil amongst its output.

W8 ABBEY TINTERN BLAST FURNACE.

SO 513003 ✶

The c1,650ft leat (dry) can be traced from the attractive pond to the receiving pond at the furnace. Stone pillars carried water to the wheel. The wheelpit survives, as do the ore dressing-floor, the casting beds, bellows site and the furnace, to full height. Operated by the Foleys since

W8: Abbey Tintern Furnace Pond *CRW*

Tintern Wireworks Bridge *CRW*

W8: Abbey Tintern Blast Furnace

CRW

at least 1669, with John Hanbury of Pontypool in partnership from 1699. Later leased and run by David Tanner. The fuel used was charcoal, cast-iron latterly being sent to Stour valley forges. At the end of the 1700s the bellows were replaced by iron blowing cylinders - a world first.

Gwent County Council excavated the area in 1979-81 and interpretative panels have been erected.

W9 UPPER WIREWORKS

SO 509003 *

Also known as New Tongs Mill, an easily-traced leat from the upper reach of the Angiddy Fawr crossed the Angiddy Fechan on a now tumble-down but interesting aqueduct. Wall remains show the building layout and the wheelpit is obvious. An overgrown annealing furnace can be found at the W end.

W10 PONT-Y-SAESON FORGE

SO 508003 *

Water-channels and walls exist below the dam and now dry pond. A once-extensive works.

W15: Coed Ithel Blast Furnace *CRW*

W11 BROCKWEIR MILL

SO 540011 *

Mill now adapted for other uses but can be seen, as can the much-damaged dam and pond.

W12 BROCKWEIR BRIDGE

SO 538012 *

Three lattice-girder spans with cylindrical iron support columns by E. Finch of Chepstow 1906. Replaced ferry at this Wyeside port and ship-building village.

W13 TRELLECH GRANGE MILL

SO 496016 *

A corn mill and miller's house survive adjacent to the dam and wheelpit.

W14 TRELLECH FURNACE

SO 493037 *

Seemingly pre-Civil War substantial remains of furnace with pond, leat, waterwheel pit and tailrace. Trellech town was a Norman plantation, until a fire in 1296 the largest town in the county. Remotely positioned even today and recent excavations have revealed that the settlement is surrounded by thousands of tons of bloomery cinder. Smelting sites lie close to the present main street.

W15 COED ITHEL BLAST FURNACE

SO 528026 *

Producing in 1650 and spending only some ten years in blast, is a square rubble-masonry structure some 24ft high with two sides standing. Blowing-house and wheelpit discernible close to the A466 Wye Valley road at Llandogo.

W16 BIGSWEIR BRIDGE

SO 538051 *

1825 cast-iron span c160ft on Monmouth Turnpike. Cast in Merthyr Tydfil. Probably the largest of the cast-iron bridges made at the south Wales ironworks. Single-storey toll-house.

W17 MANOR BROOK CORN MILL

SO 532063 *

A fine building with a dry pond and now a home.

W18 WIREWORKS

SO 536065 *

Remains are low in height and the water system includes the dam, pond and leat. At one time there was evidence of distributed slag.

W19 THE GLYNN

SO 537066 *

A paper mill c1800-1850 with a house now named Whitebrook Farm. Not large enough to have been a power mill.

W20 WYE VALLEY MILLS

SO 535066 *

A possible wire works. An extremely large collection of buildings in excellent order with a house now a private residence. The leat runs through the garden and there is no clue as to the use of steam power or large paper-making machinery. Some have interpreted this place as several small hand mills.

W21 CLEARWATER MILL

SO 531067 *

Important as the initial paper mill in the valley c1760 and the assumption can be made that a wireworks stood here. Pond and feeder stream and, by 1863, a steam engine driving a very large paper-making machine. This engine was assisted by an overshot wheel and a water turbine. Collapse followed and closure in 1875 was final.

W22 WHITEBROOK VALLEY

At some time around 1606 an offshoot of the Tintern wireworks was established here. After years of slumber the complex watercourses are sometimes not accompanied by remains capable of interpretation. Responsibility was at first that of the Company of Mineral and Battery Works, as at Tintern. From 1625 however that involvement lapsed and by the 1720s all production of wire had finished. Revivification came through the start of paper-making c1760.

This was single-sheet hand-made rag paper. 1775 was an important year as prices and quality were such as to enable competitive export success against Continental papers. This caused an explosive increase in the number of mills by 1793, certainly five and possibly six having been built. At the mouth of the Whitebrook a quay and warehouses existed for the trade with Chepstow. 1850 on saw the use of Esparto grass and a huge range of paper was produced. Steam power and continuous processes were introduced but with some premises remaining loyal to hand methods. Curiously the arrival of the WVR in 1875 saw the collapse of the industry and the valley became silent c1880.

W23 WHITEBROOK QUAY

SO 538068

Vestigial quayside and foundations and low walls of warehousing.

W24 SUNNYSIDE MILL

SO 519071 ■

The mill house survives although the mill remains are scant; two pretty ponds in the garden of the house. Across the road is a substantial stone chimney with the date 1870 set into it.

W25 FERNSIDE MILL

SO 515072 *

A paper manufactory with stables and a surviving owner's house which is now a residence. Pond is in garden. A fine recognisable building with little documentation.

W26 MILLEND FARM

SO 562091 *

Dry pond, mill and millhouse survive. Thought to be a: very ancient site possibly 1200s.

W27 REDBROOK is of two portions - Upper and Lower. Pedantically the S part of the industrial area lies in Gloucestershire whilst the N part is within Monmouthshire E of the Wye.

It is thought that a century of metalworking at Tintern led to copper-smelting here as water transport and water power together with Dean charcoal and coal were available.

1691 saw Redbrook producing copper. Unbelievably Upper Redbrook works had 26 furnaces with another 16 at Lower Redbrook. All British demand was satisfied by 1698 plus an export trade to Holland. Ore came via Chepstow from St Ives (986 ton in 1697). Development of the reverberatory furnace moved the industry to Neath and Swansea with coal as a return load to Cornwall. The Wye valley copper works ceased by 1735. The area of land released was subsequently utilised for tinplate production, certainly by 1790.Other activities saw charcoal iron furnaces in the early 1600s, moving to coke and then back to charcoal. Foundry activities outlived smelting expiring c1874. An early paper mill existed in 1691.

W28 REDBROOK TINPLATE WORKS

SO 538097 ■

The main constituent installations have been steadily mutilated or knocked down since closure in 1961, leaving water courses.

W29 REDBROOK VIADUCT

SO 536098 ✶

A curved five-span lattice-girder bridge of the WVR and dating from 1876. Now a footpath across the Wye.

W30 TRAMROAD INCLINE

SO 537103 ✶

A fine stone arch crosses the road on a self-acting incline connecting the Monmouth Tramroad to lower Redbrook. The incline is 18ft wide for double track and with a weigh-house at the top.

The tramroad opened in 1812 at c3ft6in gauge running from Monmouth town to the heart of the Forest of Dean.

W31 UPPER FLOUR MILL

SO 542108 ✶

Walls remain with the feeder reservoir at Swan Pool c1,350ft up valley being very attractive.

W32 MONMOUTH VIADUCT

SO 514120 ✶

Disused approach arches of 1861 Wye railway crossing, 20 on W bank plus 2 on E bank. Girders removed.

W33 MONMOUTH WYE BRIDGE

SO 512128 ✶

Five-arched masonry structure. The 1878-80 widening still allows the 1615 sharper-pointed arches to be seen.

W34 MONMOUTH MONNOW BRIDGE

SO 504125 ✶

Only British example of a bridge gate-tower. Three arches said to be 1272. Gatetower with portcullis 1297-1315.

W35 MONMOUTH FORGE

SO 503137 ✶

Late 18th century workers' housing at site of 1628 forge, below weir on Monnow and adjacent to 1899 water-turbine generating station.

W36 CASTLE MILL

SO 508135 ✶

Two-storey, no machinery but has mile long water channel below the castle.

W37 QUEEN'S MILL

SO 508135 ✶

The town corn mill site of 1448. The present four-storey house, of rubble with ashlar dressings, dates from the early 19th century and still has a weir in the Monnow. After 1895 two undershot wheels drove four pairs of millstones and rollers.

W38 SKENFRITH CORN MILL

SO 457203 ✶

Three-storey with loading doors and external breast-shot waterwheel. A stone plaque includes the date 1867. Adjacent bridge 1824 over Monnow leads to a coaching inn.

W39 ALLT YR YNYS OR TREWYN MILL

SO 335234 ✶

A corn mill thought to have started up as a fulling-mill. The extant building at the Honddu/Monnow confluence has no machinery but was standing by 1754. A ½ mile-long watercourse off the Honddu drove a presumed undershot waterwheel.

MC10: The first Severn Bridge *CRW*

MC1 USK LIGHTHOUSES

✶

Standing on the sea wall West Usk lighthouse (ST 311829) was first lit in 1821. Originally a tapering light tower, around which has been built (mid-19th century) drum-shaped living accommodation, 49ft diameter. Redundant since 1922 but a well executed replica lantern has been added in recent years.

East Usk light (ST 330828), on the opposite side of the river mouth, is cylindrical white tower, 44ft high, built 1893. Still operational.

MC2 GOLDCLIFF SALMON FISHERY

ST 331828 ✶

The name Goldcliff derives from iron pyrites deposits (no longer visible) at the east side of the mouth of the Usk. Salmon fishing using 'putchers' - funnel shaped traps - originally willow but now galvanised wire set into larch frames projecting 400 yards into the tideway, trapping fish on the ebb tide. Small brick smoke house, topped by 'salmon' weather vane. There is a further smoke house (both now redundant) ½ mile east along the seawall. This fishery dates from Roman times, and the right to fish is granted by royal charter.

MC3 SEAWALL

Chepstow to Cardiff ❑

The 28 mile coastline of the Severn estuary from Chepstow to Cardiff is below high tide level. It is now protected by a seawall (earth, faced with large random rocks) along its entire length. Work was started by the Romans (evidence at Caldicot ST 480880), but the major work, including a network of drainage ditches (locally, 'reens') was carried out by Dutch engineers in 17th century.

The seawall is approximately 15ft high above land level, and has been improved in recent years to protect industrial development between Newport and Cardiff. System is administered by the Caldicot & Wentloog Levels Drainage Board, formerly the Elizabethan Board of Sewers.

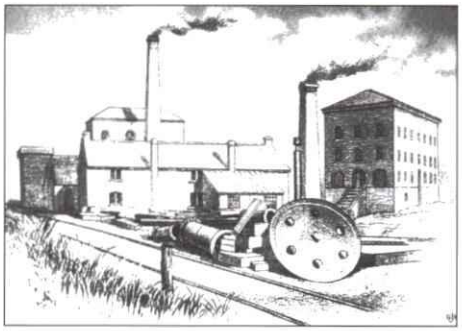
Peterstone Church Tower (ST 268801) carries a marker showing the depth of water - 5ft8in - reached in a disastrous flood when the seawall was breached in 1606. Also at Peterstone are remains of a loading wharf for very early shipments of coal by sea to the west of England.

MC4 LLANWERN STEELWORKS

ST 360870 ☍

Built for Richard Thomas & Baldwin (currently Corus) on a green-field site extending 3 miles, south of the main railway line, 1958-62. An integrated steelworks comprising blast furnace and coke oven complex, hot and cold continuous stripmills and galvanizing plant. The works has suffered from the lack of a deep-water iron ore unloading terminal, and steel making ceased in 2001, whilst doubt remains over the future of the stripmills.

above: MC9: Sudbrook Fan House *CRW*
right: MC9: Sudbrook, 1887 *CRW*



MC5 BISHTON CROSSING GROUND FRAME

ST 396872 ✶

A late GWR design of 1935, this example controls level-crossing and was installed in 1941.

MC6 LLANVACHES TURNPIKE COTTAGE

ST 428913 ✶

On old Newport - Chepstow route in Gothick style of 1820s. Was last Chepstow District gate westwards, the Newport district used a style to be seen at Caerleon.

MC7 WENTWOOD RESERVOIR

ST 430929 ✶

Completed by Newport Corporation 1896-1903 after geological difficulties crippled Glasgow contractors. Interesting for a 2½ mile tunnel from Castroggy Brook to N. Locally-quarried stone with aerial ropeway from E for clay.

MC8 CAERWENT MUNITIONS FACTORIES

ST 480910 (approx) ■

Site chosen as a Royal Naval propellants factory 1940/1 due to the availability of water from the Severn Tunnel [MC9] and transferred to US administration in 1967 for weapons storage. Closed 1993 and now used for military training. 1,600 acres and up to 400 buildings but secrecy prevails and little detail is known. Has its own rail system, connected to the main line.

MC9 SUDBROOK AND THE SEVERN TUNNEL

ST 506875 ✶

Sudbrook was built as a model village in 1873-86 by Thomas Walker, contractor for the Severn Tunnel, for his workmen, and for later railway staff. There are nine brick, 2-storey terraces of houses, plus a terrace of ten houses constructed 1882-4 of concrete blocks. Surviving communal buildings are the school, post office and infirmary. The site is dominated by the tunnel pump house, which contained six Cornish beam engines to pump 20 millions gallons of water a day from the Great Spring. Also to be seen are the fan house and two other pump houses once containing a single Bull engine and a beam engine. Steam power was withdrawn in 1964 and the engines dismantled. Immediately east of the village are remains of shipbuilding slipways (late 19th - early 20th century), whilst one mile east is the railway cutting and jetty base of New Passage Ferry, which preceded the tunnel.

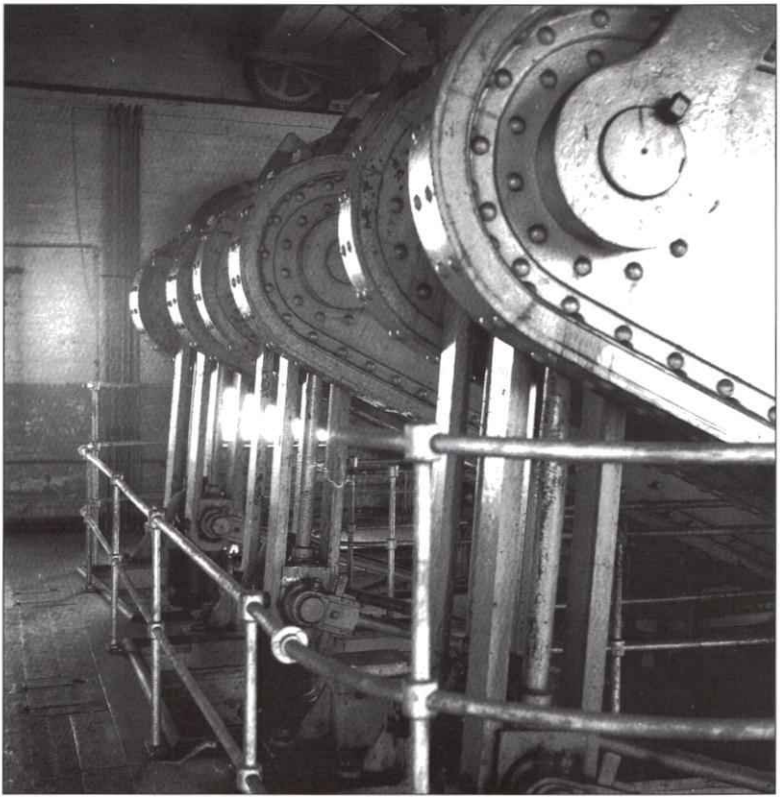
beow: MC10: The Second Severn Crossing *CRW*

MC10 THE SEVERN BRIDGES

✶

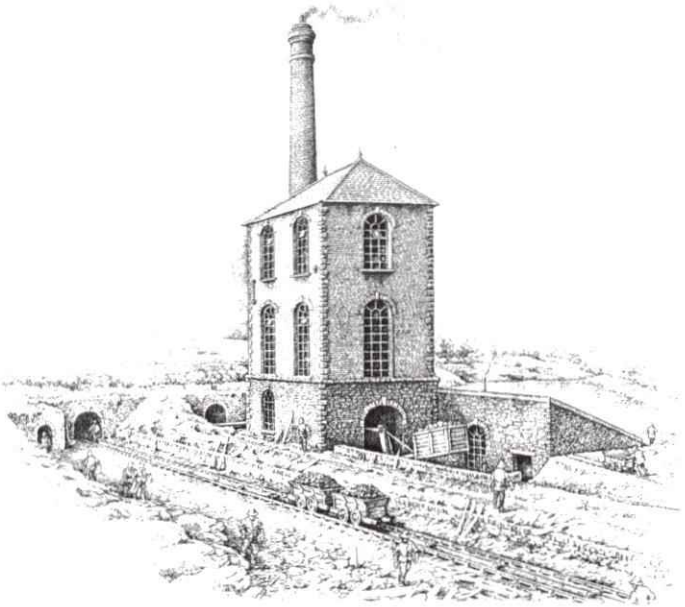
The first Severn Road Bridge (ST 560950) and its western approach over the Wye were built 1961-6 to the design of Freeman Fox. The main bridge is a suspension type, with a welded box section deck, which was constructed in Chepstow and floated down the Wye section by section then winched into place. The Wye viaduct is of cable-stayed cantilever construction. Both were substantially re-inforced in 1982-91.

The Second Severn Crossing (ST 510873) was designed and built 1992-6 by Sir William Halcrow & Partners and the French civil engineers SEEE. The central section, over the deep water channel, is a bridge of 1,495ft span. The remainder of the 3¼ mile length consists of two concrete viaducts, the whole carrying the 6-lane M4 motorway.



MC9: Sudbrook, 1967, proir to scrapping *MJM*

Bridges & Viaducts	CF11, CF16, T8, T19, T20, T24, T25, T27, T30, T35, T44, T48, T59, T61, TC4, TC5, TC6, EL3, O5, O7, O10, GC6, NP2, NP10, NP15, RH1, RH6, RH9, EB2, EB4, EB16, EB21, S1, S3, S14, U1, U2, U3, U6, U7, U10, U21, U25, AL1, AL12, AL16, W2, W3, W12, W16, W29, W32, W33, W34, MC10
Brewing	CF21, AL18
Church & Chapel	T62, EB10, S7, AL24
Canals	CF6, CF11, CF16, T3, T6, T11, T22, T28, T29, T30, T31, T32, T33, T37, EB4, EB11, EB13, EB17, U5, U11, U16, U19, U23, U26, U28, U29, AL8
Cemeteries	CF18, T60, EB8, S12, U12, U25
Coal Exchange	CF4
Coal Mining	T10, T13, T20, T26, T36, T41, T42, T49, TR1, TR2, TR3, TR8, TC10, WL6, RH10, RH12, RH15, RH16, EB15, EB19, S2, S4, S11, AL5, AL7, AL13, AL22, AL26, AL27, AL28, AL32
Coke Production	EL5, S8, O8
Copper Smelting	W27
Corn Milling	CF23, NP17, RH13, S5, U4, U17, W5, W7, W8, W11, W13, W17, W24, W25, W31, W36, W37, W38, W39
Custom House	CF12
Defence	O2, GC1, MC8
Docks & Harbours	CF1, CF2, CF3, CF6, CF7, CF8, CF9, CF10, CF17, EL1, O1, GC3, NP1, NP5, NP14, W23
Engine Houses	T52, TR1, TR3, TR6, TC3, EL2, EL6, O8, RH10, RH12, RH15, RH16, EB15, AL7, AL13, AL14
Foundries	AL10
Gas production	CF22
Housing & Communities	CF23, CF24, T43, T46, T53, T54, T55, TR5, TC8, EL1, NP11, RH17, EB12, EB20, EB24, EB25, S6, S10, S11, AL2, AL9, AL21, AL24, W1, W35, MC9
Institutes	CF23, TR7, EB5, AL24
Iron Mining	T7, T49, T50, AL26, AL28



RH10: Bryngwyn Colliery, Bedwas, about 1870.

© David Bick

Iron & Steel	T38, T40, T45, T52, T56, TC1, TC3, TC9, O4, O6, O8, O9, NP3, EB14, EB22, EB23, S9, S10, S13, U13, U15, U20, AL14, AL25, W6, W10, W14, W15, W27, W35, MC4
Lead Mining	RH5
Lighthouses	GC1, GC9, O1, MC1
Lime Kilns	T48, TC9, GC1, RH3, S9, U5, U15, U16, U23
Malting	CF17, GC10, NP4
Markets	TC2, NP8
Mineral Water	TR4
Monuments	T57, NP14, AL19
Museums	CF23, EB5
Paper production	W19, W21, W22, W27
Pottery	T14
Quarrying	T2, T7, T58, RH3, EB9, U21, AL15, AL23, AL30
Railways & Tramroads	CF5, CF20, T5, T8, T9, T12, T21, T23, T24, T26, T34, T35, T47, T48, T51, T59, T61, TC4, TC5, TC6, O1, O3, O5, O7, O10, GC3, GC4, GC5, GC6, NP9, NP12, NP13,
railways & tramroads continued	NP15, NP16, RH4, RH6, RH9, RH11, RH14, EB1, EB2, EB3, EB4, EB7, EB16, EB18, S1, S2, S3, S14, U8, U9, U14, U21, U22, U23, AL4, AL12, AL15, AL16, AL17, AL29, AL31, W3, W4, W29, W30, W32, MC5, MC9
Roads	EL3, EL4, RH2, MC6, MC10
Salmon Fishery	MC2
Steam Engines	T18, TR1, TR3, EB19, AL7
Sundry Industry	T39, GC7, NP18, EB26, U3, AL11
Tinplate	T4, T16, RH7, RH8, EB23, W27, W28
Toll houses	CF23, RH2, U3, AL8, MC6
Trading Estate	T15
Warehouses	CF13, CF14, CF15, T14, O1, NP6, NP7, U11, U16, W22
Water supply	T63, T64, TC7, EB13, U27, U30, AL6, AL30, AL32, MC7
Waterwheels	CF23, T3, RH13, S5, U4, W38
Weirs	CF17, T1, T4, T17, T31, T36, T50, W37
Wire Mills	W7, W9, W18, W20, W21, W22
Woollen Mills	CF23, U18

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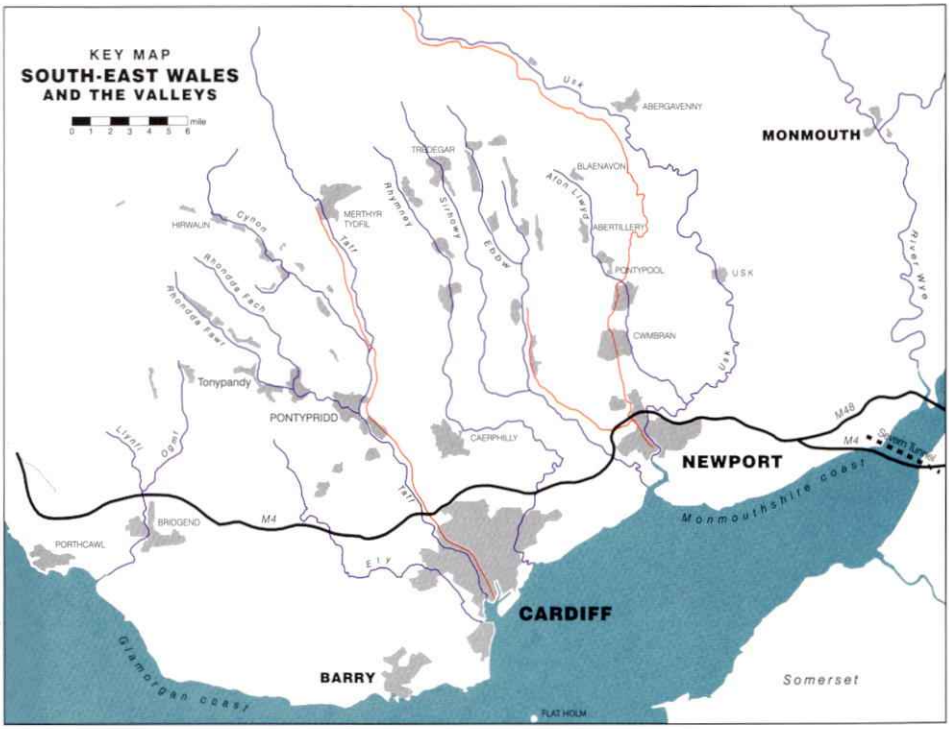

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AUTHORS AND ACKNOWLEDGMENTS

Compiled by Terry Evans, Michael Messenger, Stephen Rowson, Peter Wakelin and Robin Williams. The authors are grateful for the assistance received from Cadw: Welsh Historic Monuments and from Stephen Hughes and Brian Malaws at the Royal Commission on the Ancient and Historical Monuments of Wales, Aberystwyth. John Stengelhofen has redrawn the maps as well as prepared the layout of the book. Roger Hateley and Gordon Green of the Industrial Railway Society kindly gave permission for their map of the Monmouthshire tramroads to be used as a base for that in this book.

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This book is being published to mark the AIA's 2003 Conference at Cardiff. 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 the quarterly *Industrial Archaeology News*. Further details may be obtained from the AIA Liaison Officer, AIA Office, c/o Department of Archaeology, University of Leicester, Leicester LE1 7RH.

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Design: John Stengelhofen
Print: Pryntya Ltd, Redruth, Cornwall

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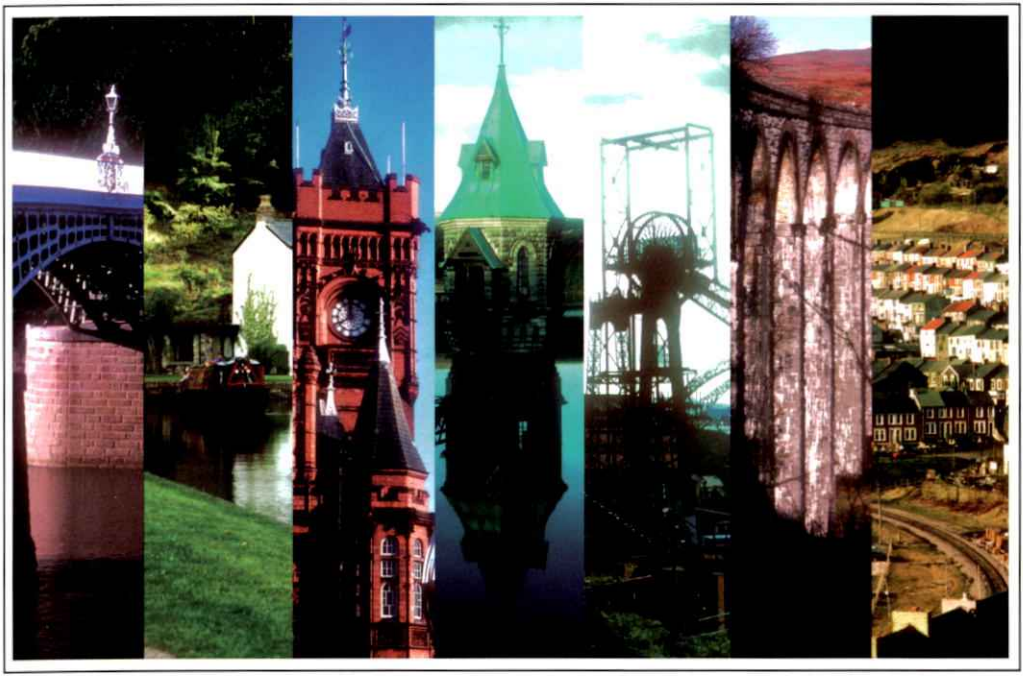

ISBN 0 9528930 6 1