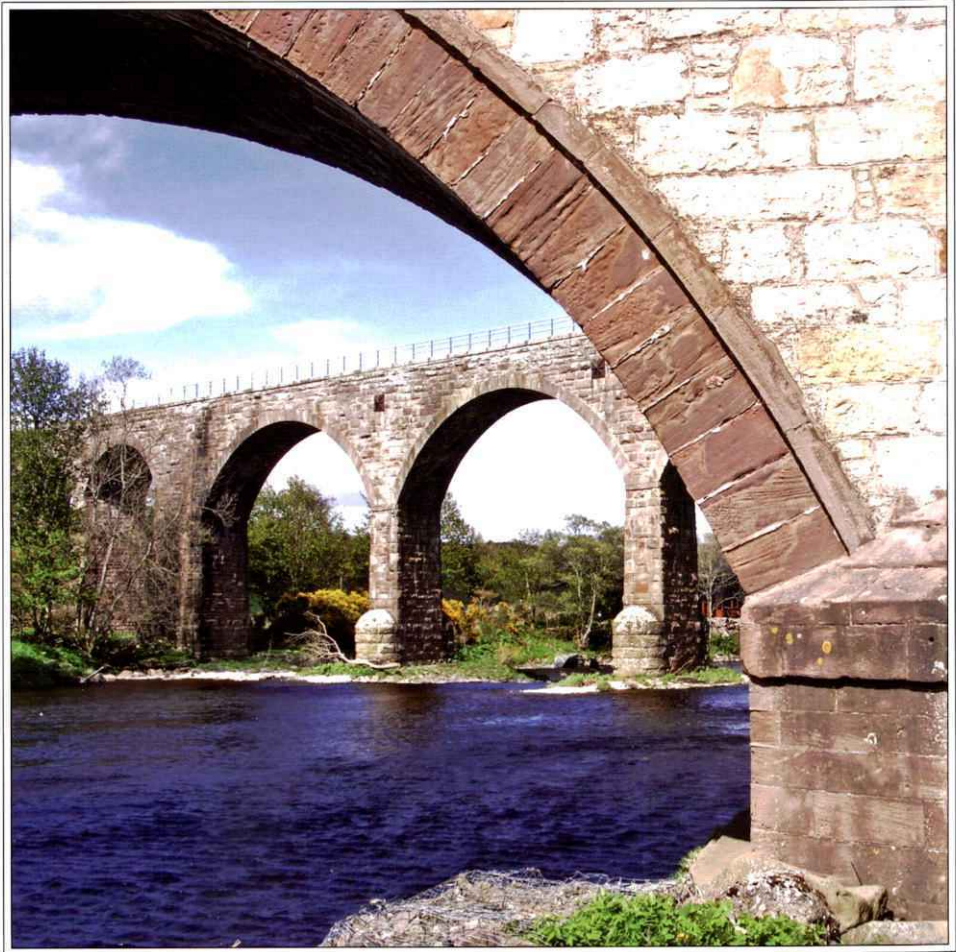


**A GUIDE TO THE
INDUSTRIAL ARCHAEOLOGY OF**

T A Y S I D E

**Dundee, Angus,
The Mearns and North Fife**



MARK WATSON
Association for Industrial Archaeology

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Each gazetteer entry has a letter or letters and a number that relate to the location maps and the index. A National Grid Reference is given to aid accurate location. Sites are broadly organised from west to east and progress up the coast from the south-west to the north-east. They lie in the local authorities of Angus and the City of Dundee, with parts of Fife, Aberdeenshire and a corner of Perth and Kinross.

Designated status is best checked by contacting the planning authority or on line.

NOTE: The inclusion of sites in the gazetteer does not imply public access. Whenever you are in doubt it is always courteous to ask permission to enter a site.

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ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

This book is published to mark the AIA's 40th Annual Conference, in 2013 at the University of Dundee hosted by the Scottish Industrial Heritage Society, with the Scottish Transport and Industrial Collection Knowledge Network (STICK). 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, The Ironbridge Institute, Ironbridge Gorge Museum, Coalbrookdale, Telford TF8 7DX.

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COVER ILLUSTRATIONS front cover: North Water Viaduct, 1865, seen through an arch of the Lower North Water Bridge, 1775 (AN46)

back cover: Seafield Works, chimney of Baltic Works and Magdalen Green Bandstand, Dundee DW12-14 (© Historic Scotland, Mark Watson)

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A GUIDE TO THE INDUSTRIAL ARCHAEOLOGY OF T A Y S I D E

DUNDEE, ANGUS, THE MEARNS AND NORTH FIFE

MARK WATSON



DW15: Tay Bridge with a 'Black 5' crossing during the Great Britain IV tour, 2013

INTRODUCTION

Known for 'Jute, Jam and Journalism', Dundee is springboard to a beautiful part of Scotland coursed through by the River Tay. Its industries are deeply rooted in the countryside round about, and are distinct from those in Scotland's central belt. In the medieval core of the city there was the jam and is the journalism. Jute, linen and engineering factories, retained through adaptive re-use, cling to the sides of the volcanic Law. Docks and wharves house the city's maritime industries and historic ships.

To the north lies Angus and Mearns, and to the south the Howe of Fife, fertile farmland and towns once dedicated to linen weaving, skirted by a picturesque coast still important to traditional fishing and maritime industries. The old counties of Angus and Kincardineshire cross the Highland line from busy Lowland to romantic Highland Scotland, with consequent topographic challenges to engineers, varied geology represented in local buildings, and an opportunity to define local whisky as Highland malt.

Building materials are of sandstone (giving way to granite north of Stonehaven) and with slate roofs unless otherwise stated. Local variations include harling, limewash or slaister/ butter pointing where the "random" (but in fact carefully coursed) rubble work needed protection by lime. Cement rendering, sometimes with applied decoration, might replace lime from the late 19th century, particularly in coastal locations, Montrose to Inverbervie. Brick might be reserved for specific industrial types, like the chimney stalk, which evolved from square to octagonal to circular section. Clay and a few brick buildings are found in the Errol and Luthermuir/ Craigo areas. Most industrial buildings are in the 'functional tradition' exemplified by regular proportions and the use of quoins, skewputts and finials that define the edges of roofs. 'Grey slate' or riven paving slabs was used as roofing in Angus, half-slated where ventilation was needed, and in some cheaper buildings in Fife, pantiles fringed with slate. Scotch slate (quarried in Perthshire and Argyll) is fixed to sarking, not battens, and this allows for repeated trimming and re-use of even quite small sizes, in candle-snuffer turrets and kilns. Railways brought a wider variety

Construction of a typical 'fireproof' mill, built 1836, shown during the demolition of John Street Mill, Arbroath, in 1986. Similarities, except the brackets, to Logie DW16, Pitalpin DW2, Tay DW23 and Dura Works DE6 suggest this is the work of Umpherston & Kerr, Douglas Foundry, Dundee.



Sash and case windows, small panes of crown glass were cheapest.

Inverted T-section parabolic cast iron beams run side to side of mill.
Shallow brick arches span lengthwise
Cast iron columns at junction of beams with brackets to support horizontal shaft distributing power from the engine house. Most mills in Dundee just suspended shafting from beams without brackets.

Wrought iron ties the arches together

Roughly coursed rubble sandstone walling with lime mortar

of building materials and local styles are less well-defined from the 1850s onwards: Dumfriesshire red sandstones and Welsh slate are found by the end of the century. Flashings are of lead, later zinc, and rainwater goods from the late 18th century onwards are of cast iron.

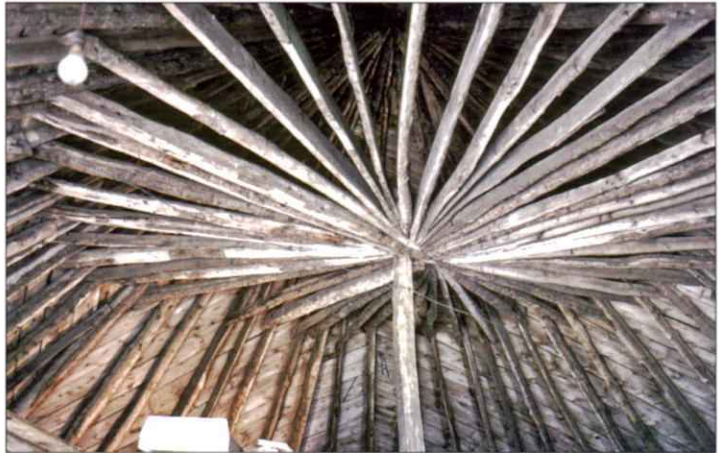
Houses: Most 'houses' are in fact tenements: blocks of several "room and kitchen" houses reached from deck access "platties" via free-standing stair towers, to which toilets might be added, or via internal stairs. This might even apply to terraced cottages with attic spaces. Some over-sized cottages held handlooms but more of these were concentrated in ground floors of factories, the upper floors being louvred warping/ starching lofts. Single storey loom shops are easily altered but those in two storey houses are recognisable, e.g. the many ground floor 4-loom shops in Kirriemuir. Some inter-war council houses are 4-in a block with an entrance in each elevation. The 1960s "Multi's", hi-rise that characterise Dundee's skyline, are programmed to be demolished, and several are already down.

Farming is mixed arable, with fruit farms on the Carse of Gowrie and around Blairgowrie. Most farms are products of agricultural improvement, and those that predate the threshing machine are often distinguishable by horse mills, with conical roofs in Angus and Perthshire, octagonal pantiled roofs in Fife, and sometimes windmills or chimneys for steam engines, while those that post-date 1790 might be sited from the start to exploit waterpower. Wheels for threshing mills might be in very deep pits, the lade and tail race both culverted. Steadings usually form three sides of a square, sometimes with roofed cattle courts. A C17th-18th farmhouse might face into that court, a C19th one would front it or stand apart. Pre-improvement Farm Touns are mostly archaeological bumps in the landscape, with conical depressions left by drain-drying kilns, but Rait, Perthshire, is a rare example that has survived.

Grain mills: Scottish corn mills had the benefit of thirlage until 1799, requiring tenants to take their oats and barley to specific mills. Many mills bear 18th century or earlier dates, but the machinery is usually from the later 19th century. Only a few timber wheels survive indoors. A characteristic element is the kiln that dried oats or barley before grinding, tending to be more architecturally dominant further north. Semi-circular kilns are found in Angus. Two pairs of stones were often enough but Milton Mill, Monifieth had 12, helped by a steam engine, and Mountgarie Mill, Aberdeenshire has 5 pairs still in operation. As the stones and gearing are often gathered at a gable of the mill, it has been possible to keep these in some conversions. Water is conveyed to a mill in a lade (leat) from a cauld (weir). Single ring "start and awe" paddle wheels are often found in the north east. No fully complete windmills survive in mainland Scotland, but some towers exist, often adapted to doocots (dovecotes).

Textile industry: the first large-scale industrial sites were bleachfields north of Perth and Dundee. They had extensive sloping fields on which the linen cloth was laid to bleach. Waterpower was used for scutching (preliminary stage in flax manufacture) and beetling (wooden hammers on cloth). Flax spinning was introduced in 1787 into pre-existing mills. In that industry 'the Mill' was for spinning, 'the factory' for producing manufactured cloth, whether by hand or powered processes and was often

Horse mills powered threshing machines at most farms. In Angus and Perthshire they typically are circular with small slates at the top, the roof structure fanning out of many split spars. Scotch slate is fixed to sarking boards (seen here) allowing very small slate to be used. Pantiles and 'grey slate' flags are fixed to battens in the Welsh and English manner, so in Fife pantiled horsemills are octagonal.



© SIHS Eric Watt collection:
a typical farm in Glen Shee
with Horse Mill

known as 'Works', including those that were vertically integrated from spinning through to weaving and finishing. 'Calenders' applied a smooth finish to the cloth, and supplanted the rural beetling mills at bleachworks. Distinctive elements in powered textile mills are: vertical integration and varied scales of production; predominance of fireproof construction after 1828; 3-bay widths leading to gothic cast iron nave and aisle treatments of roofs: weaving sheds powered from below, so permitting broad roof spans; single storey spinning mills from 1865 onwards.

Engineering passed from the village smiddy to the foundry, a term usually applied not just to the casting of metal but also to the making of machinery. Steam engines were being made locally from c1810. Dundee pioneered locomotive engineering in Scotland, and those trained there went on to develop that industry in Montreal, Swindon and Doncaster. But once a rail connection was achieved to Glasgow in 1850 that industry stopped. Branches took up shipbuilding and some small towns could develop niche products, like Auchtermuchty and weighing machines, F6 Cupar and pumps/ milestones.

see table, on next page, for Textile machinery manufacturers.

Transport: Water: Until 1850 the best way to move about was by sea up and down the coast as well as across rivers. There are no canals for transport in the region covered here. In 1836 there was almost as much horse power deployed in Dundee's steam navigation fleet as there was in the city's spinning mills. Passenger transport to London by fast overnight steamers run by the 'DP & L' (Dundee, Perth & London), launched in the Caledon yard in the 1880s, still competed against rail travel. So harbour

MAIN SOURCES OF MACHINERY IN THE SCOTTISH JUTE AND FLAX INDUSTRY c.1850- c.1950

Preparing, spinning, reeling	Douglas Fraser (Giddings & Lewis Fraser)	Westgate Foundry, Arbroath	AR13
...	J F Low	Monifieth Foundry	
...	James Mackie	Belfast	
...	Combe Barbour (FLCB)	Belfast	
...	Fairbairn Macpherson		
...	Fairbairn Lawson (FLCB)	Hope Foundry, Leeds	
Weaving, finishing, millwrights	Urquhart Lindsay (ULRO)	Blackness Foundry, Dundee	
...	Robertson Orchar (ULRO)	Wallace Foundry, Dundee	
...	Charles Parker (ULRO)	Mid St/ Clepington Rd, Dundee	
...	LEFCO	Lawside Foundry, Dundee	DW5
...	T C Keay	Densfield Works, Dundee	DE2
Jacquards	Hutcheson	Dunfermline	
Sewing machines	D J MacDonald	St Roques Works, Dundee	
Hackle-makers; card pins	Halley Brothers	N Lindsay St, Dundee	D3
...	W R Stewart	Dens/ Panmure Yd Dundee	DD6
Shuttles and bobbins	McGregor and Balfour	North Tay Works, Dundee	DW5
...	Gateside Mills Co,	Strathmiglo, Fife	F3
...	James Stiven	Tayport, Fife	
Also making their own machinery:	Baxter Brothers	Dens Works, Dundee	DE9
...	Cox Brothers	Camperdown Wks, D'ndee	DW4
Steam engines	J&C Carmichael	Ward Foundry, Dundee	DW22
...	Douglas & Grant	Dunnikier Foundry, Kirkcaldy	
...	Pearce Brothers	Lilybank Foundry, D'ndee	DE14
...	Musgrave	Bolton	
(and later marine engines)	W B Thompson	Tay Foundry, Mains Loan, Dundee	
(and later marine engines)	J Stirling/ Gourlay Bros	Dundee Foundry	DE10
Waterwheels, millwrights	Umpherston & Kerr/ John Kerr/	Douglas Foundry, Dundee &	
(and in 1890s steam engines)	Thomson Bros	Victoria Foundry, Clepington	

improvements, ferry slips and lighthouses facilitated transport. Among these the Bell Rock light house is world-important as the oldest sea-washed rock light in the world (AR7).

Roads were abysmal until in the age of improvement turnpikes made some progress with handsome stone bridges and toll houses too many to list in this book. Previously, the main bridge builders had been bishops. Drove roads make interesting paths through the highland glens, as do the Military Roads through Perthshire, and Cairn O' Mount in Kincardineshire. A family of blacksmiths, John Justice (senior and junior), has left an intriguing legacy of wrought iron stayed bridges in Glen Isla (AN1) Haughs of Drimmie, Perthshire, Crathie, Aberdeenshire and probably the Loups at the Burn (M2) and Lintrathen (D16, arched). They show the evolution of an indigenous solution to challenges by an untutored but exceptional blacksmith. There are some cast-iron bridges, but not as many as in Aberdeenshire. The most interesting of the 20th century bridges were Montrose (AN38) and the Tay Road Bridge (DD3).

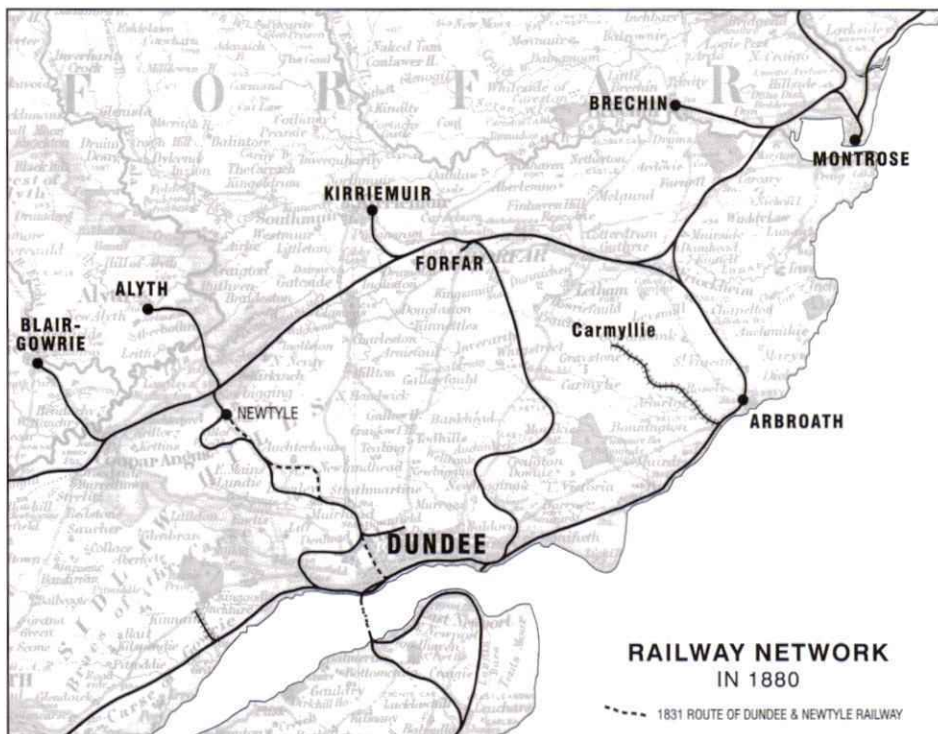
Railways: The pioneer here is the Dundee & Newtyle (DG2), first planned in 1825. It and other early routes were not seen as forming one network, so they might come to a halt in odd places, or take routes as if they were part of the road network (hence the severing to this day of Coupar Angus in two, as new roads took the railway line). Level crossing houses of 1838-1849 look a lot like toll houses, and the earliest station proper is probably Broughty Ferry (1838, DG18). Railway workshops are relatively

small-scaled at Ladybank, Fife (F10). The Tay Bridge (DW15) is stupendous, and other bridges can't compare, many of those on the Aberdeen Railway having been replaced as they originally were of timber laminated arches (M10 and M20).

Services: Water is usually delivered in Scotland by gravity. There are no preserved steam pumping engines in Scotland. But there are dams, two stone aqueducts leading into Dundee and water towers exist at Montrose, AN44, Arbroath AR4, Ladybank, F11, and Menziesshill, DW0.

Gas supply: little evidence is left apart from some rural spinning mills, AN21, a big gas holder in Dundee and parts of retort houses in Aberfeldy and Kirriemuir, beside AN7, for example.

Electricity was generated in small-scale ways from water power, and several country houses had their own power stations by 1930. The trams converted to electricity in c1900, and the first all-electric jute mill (self-generated) was Hillbank Works in Dundee, 1907 (at centre of aerial photo at DE3). First and second generation coal-fired power stations no longer exist, and the post-war hydro power schemes that make local energy use relatively carbon-neutral are further north and west in Perthshire and beyond. Wind turbines tower over the Michelin tyre factory in Dundee, near DG14, where they somehow fit rather well.



Map showing the railway network as it was in February 1880 in Angus, parts of Fife, Kincardineshire and Perthshire. The connection to the Tay bridge has been formed at Wormit, and there is still a loop to the railway ferry at Tayport and Broughty Ferry, pressed back into service on 1st February 1880 after the fall of the bridge. The more direct east coast main line route from Arbroath to Montrose is under construction (1880-1883). There are branches to Inchtute, Blairgowrie, Alyth, Kirriemuir, Brechin and Bervie, and the Carmyllie Quarries have their own mineral line to Arbroath, opened in 1854. The initial route of the Dundee and Newtyle Railway is shown, along with deviation loops formed to the east in 1860-1861.

The Howe of Fife is rich agricultural land that supports a number of related industries like malting, brewing and sugar beet refining. It was also important for linen production, leading to quite large scale linoleum works in Newburgh and Falkand. The coast line has left important harbours, and the road network is marked by cast iron milestones cast in Leven and Kirkcaldy Foundries, many of which are copies fixed to concrete to avoid the predations of "collectors"

There was a successful campaign to resist greater Central and Tayside Regional Councils that would have split Fife in 1975. Central and West Fife. The former Kirkcaldy and Dunfermline Districts, are covered in the AIA Gazetteer, J.C. Crompton, *Forth and Clyde* (2002), and so only North Fife is included here.

F1 NEWBURGH

A913, NO236 187

A small town still with some thatched houses, one long picturesque street and riggs running off that spine. The town was known for linen weaving and has a number of freestanding workshops in the rears of closes, but their precise purpose is unclear. There formerly was the Tayside Floorcloth Co (floorcloth from 1891; linoleum from 1904) Factory down by the harbour, demolished in 1986 for playing fields and a car park. There is a cast iron girder railway bridge under the track, and a small harbour with stone pawls (bollards).

F2 PARKHILL MILL, NEWBURGH

East side of Newburgh, Coastal road to Lindores
NO 24524 18566

Possibly built in 1859, the date of improvements to the adjacent farm steading and apparently once forming part of that complex. The overshot timber and cast-iron waterwheel is external to one gable. Unlike mills further north, the kiln is not readily identifiable by any external flourish. It recently became a private house.

F3 GATESIDE BOBBIN MILL

East of village, signed from A91. Visitable
NO1889 0921

Founded for flax spinning in 1805, it became a bobbin mill for the Gateside Mill Co in the later 19th century. Rebuilt in brick in 1949 after a fire, the mill is signalled by the chimney stalk, one of the very few surviving to their full height with their cornice intact. This served a Lancashire boiler. The ground floor of the mill is where bobbins were made, and the first floor was for shuttles. Now it contains a number of craft workshops, and a tea room. The wheel had been replaced by a turbine, now missing, but its sluice exists just outside the mill. Other buildings include a

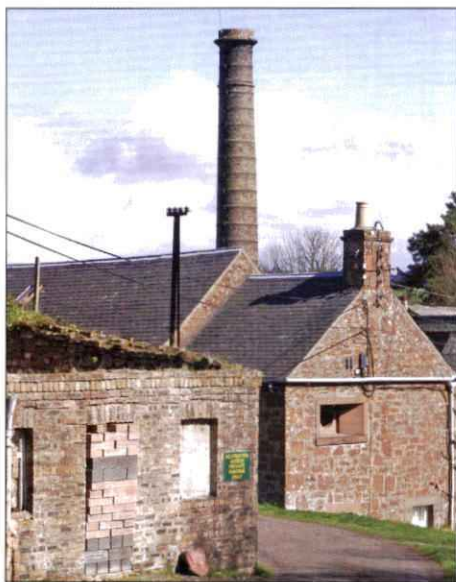
detached brick building with ventilator slots for seasoning timber, a stretch of former railway line bridging the River Eden and older stone buildings that had escaped the fire.

F4 STRATHGLO LINEN WEAVING (THOMSON'S)

Skene Works, Skene Street, NO 2139 0993
East Bank Works, Cash Feus NO 2185 0998

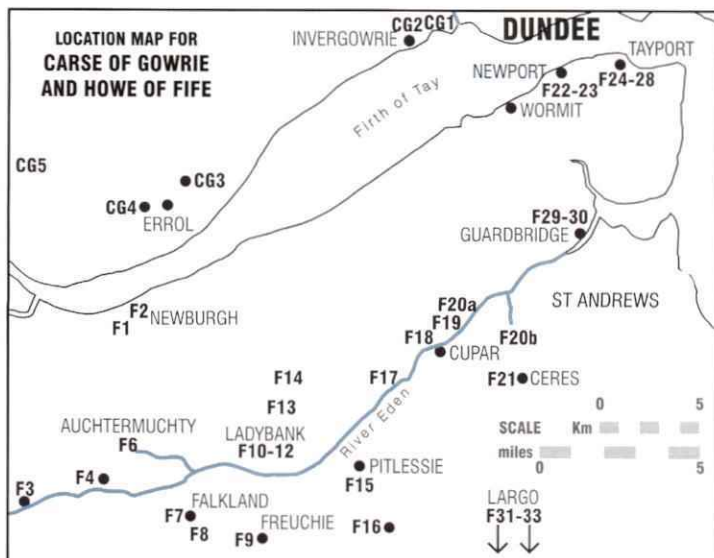
The parish had 500 weavers in the 1840s making dowlais and using a bleaching green by the River Eden (hence the wide open village green today).

Skene Works was built before 1854 (on O.S. map), probably the first power loom factory in this part of Fife. "A new power loom work has been established by Alexander Troup... 16HP, nearly 100 looms" (Warden). This must be the



F3: Gateside Bobbin Mill

FOR GAZETTEER
ENTRIES IN CARSE OF
GOWRIE SEE PAGE 15



three-storey L-plan building, with a shallow roof, now converted to houses and a joiner's shop on Skene Street. There only was a small shed, ornate chimney and engine house, now removed. On the opposite, south, side of Skene St are some characteristic hand loom weavers' cottages with a second window to one side of the door.

East Bank Works, a more typical -1 and 2-storey power loom factory, is further to the west at Cash Feus, c1865-1899, now a joiner's. Both were worked as linen weaving factories by different branches of the Thomson family in 1935.

Weaving and starch-making were also important activities in Dunshalt and Auchtermuchty. See cul-de-sac of weavers' houses at Middleflat in Auchtermuchty.

Ref: AJ Warden *The Linen Trade Ancient and Modern* (1864)

F5 STRATHEDEN OR AUCHTERMUCHTY DISTILLERY

Bowie Hill / Distillery St, Auchtermuchty
NO 2185 0998

The distillery operated from 1829-1926 re-using an illicit still. Still standing is the town's mill, according to numerous re-used stone carved plaques dated 1678, 1766 and earlier, that was incorporated into the distillery to mill the malt. In all three water-wheels took power from the small burn running through the burgh. A 3-storey bonded warehouse is inscribed WH1896. Timber floors were removed c1990, leaving the iron framework, and building work in abeyance, whereas the maltings and main distillery production buildings were redeveloped c2000. The distillery was owned by the Bonthronne family, maltsters and brewers (see F8, F15)

Ref: B Townsend *Scotch Missed* (1997)

F6 WHITE'S FOUNDRY, AUCHTERMUCHTY

South side of main road, A91
NO23994 11536

Known for its weighing scales, many examples found in farms and corn mills roundabout. Opposite a narrow stone bridge, a stone-gabled engineering shop had its second floor added in 1897. This was converted to flats in c.2004. Modern foundry buildings of the early 20th century were further south. A new foundry of 1921 was demolished soon after it was film set for an episode in "Dr Finlay's Casebook".

F4: *Skene Works, Strathmiglo*



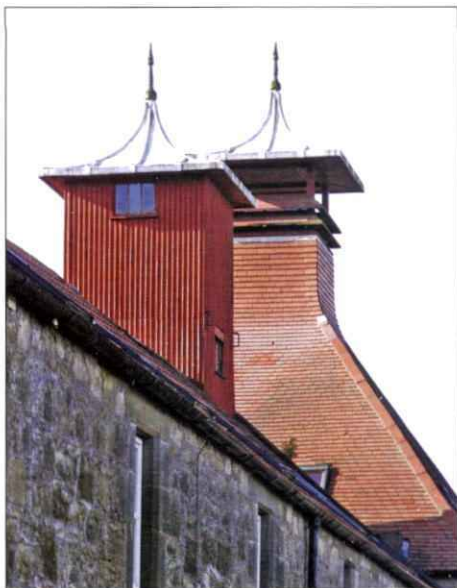


F7 ST JOHN'S LINOLEUM WORKS

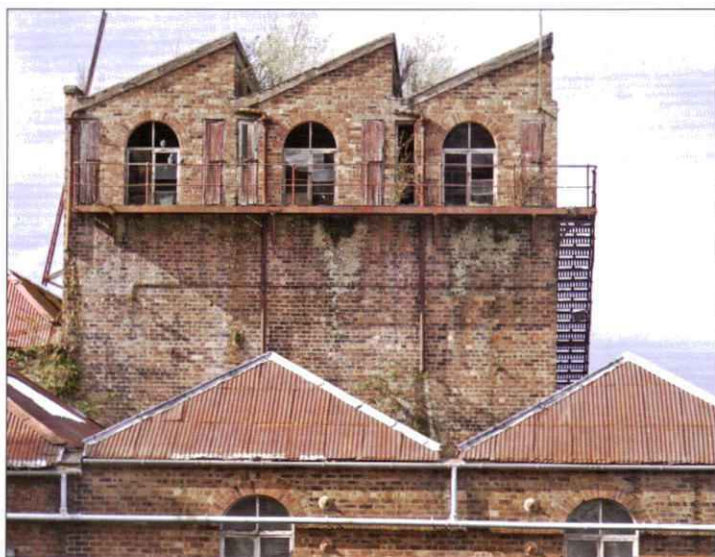
Falkland, A912, on hillside

NO2535 0715

The older part was built in brick between 1892 and 1912: a range of buildings with a serrated row of roofs over arched windows at each drying chamber, the whole fringed by balconies for access. At first making floorcloth, it expanded considerably in 1933 when it was owned by SCWS (Scottish Wholesale Co-operative Society). The reinforced concrete framework is filled with glass and brick, and makes no concession to the 'heritage' location of a village containing Falkland Palace.



A lino works requires tall drying chambers in which to dry the freshly pressed linoleum. These have been floored across to make the works suited to other uses. Until 2013 this meant production of plastic packaging bags by the papermaker Smith Anderson and Co, based in Leslie, Fife. Raw materials were stored at the west of the complex in large warehouses clad in corrugated iron.



above left, F6: White's Foundry, Auchtermuchty (see previous page) above, F8: Pagoda elevator and kiln, Bonthrone's maltings, Newton of Falkland

F7: St John's linoleum Works. The second phase, pre-1912, drying tower has not been used since lino production stopped. The inter war buildings are in much better condition but closed in 2013

F9: Eden Valley Works,
Freuchie



F8 BREWERY AND MALTINGS, NEWTOWN OF FALKLAND

NO 26847 07103

Bonthrone's brewery is on the north side of the road, late C18th, and the three-storey maltings are on the south side, running at right angles to it. Both were converted to houses, 1993-94.

The kiln and a barley elevator have pagoda roofs clad in flat rosemary tiles and corrugated iron. There is a complete circular-section brick chimney.

F9 EDEN VALLEY WORKS (WM LUMSDEN'S)

Freuchie, B936 East of Falkland

NO28477 06963

1860s powerloom linen factory in the style of Robertson & Orchar of Dundee, a two storey frontage to a weaving shed, with loading doors. The factory was converted to flats in c 2005. Lumsden was a paternalist provider of housing and Lumsden Memorial Hall is one of the reminders of the importance of the firm to Freuchie.

F10 LADYBANK RAILWAY STATION AND RAILWAY WORKSHOPS

In Ladybank on B9129, 6 miles N of Glenrothes
NO 30635 09645, NO30NW 88

Built for the opening of the Edinburgh and Northern Railway, in 1847, from Burntisland to Tayport. The route made possible a journey from Edinburgh to Dundee in much shorter time, and here also is the junction on the line to Newburgh (1848), and then Bridge of Earn. Ladybank is distinguished by its asymmetrical composition and a detached Laird's waiting room on each platform, a small corrugated iron goods shed and on the down platform a typical NBR timber and brick station of the 1890s. Railway workshops, timber, brick and stone, occupy the east side of the track, and a c. 1870 hand crane by James Todd and Son of Edinburgh.

The oldest and most interesting of the workshops is one facing the line to Newburgh, 1848. It has two double pitched roofs of Polonceau trusses, now collapsing, divided by a line of iron columns, four large arched timber doors, diamond-paned windows and the base of a post crane. This was



F10: Early railway
workshop on the line to
Newburgh at Ladybank
is passed by the Great
Britain IV to Inverness,
in 2013

latterly a signal and telegraph works, but now is reverting to nature.

Other stations on the Edinburgh and Northern are in similar Italianate style, e.g. Burntisland, and Cupar (F18). Smaller halts are Jacobean, all by Thomas Grainger e.g. F17.

F11 THE SCOTTISH COMMAND LINE

Ladybank NO 3035 1072

Collessie, NO 28332 14076

This was dug to stop invaders in 1940 across Fife from Dysart to Newburgh, and then from the bank of the Tay at Kinfauns to Birnam. Dragon's teeth, concrete blocks are sewn evenly into a field. The W bank survives parallel to the railway, which would form part of the defences. A further short length, from NO 2975 1152 to NO 2965 1165 runs NW from a minor road immediately E of the railway overbridge. A section of ditch from NO 3035 1072 to NO 3012 1106 survives NW of the bridge over the railway N of Cairnfield.

Ref: Gordon Barclay in TAJ 17, 2011, and Canmore

F12 LADYBANK WATER TOWER

Golf Street, Ladybank

NO 3304 3692

An elevated water tower in ornamental brick is inscribed 'Ladybank Waterworks 1908'. The land round about is flat so this is a particular landmark.

Ladybank is a new town that owes its existence to the railways. It has a 1½ storey maltings and a kiln, now a garage, that was one of several owned by Bonthron, and rows of weavers' houses,

F13 MELVILLE WINDMILL / DOOCOT

On the A91, just west of roundabout with A914. Turn off it into a track.

NO 30271 12657, NO31SW 2

The substantial remains of a tall, tapered and vaulted tower mill. Today the tower is 30ft high and



F13: Vaulted windmill

stands on a lofty mound of earth into which the vaulted undercroft is inserted, angled to achieve a throughput of wind. Converted to a doocot, the present interior fittings (rotary ladder, slate roof and bird boxes) can be viewed if the key is obtained from the adjacent cottage. Recently repaired, the interpretation refers only to other doocots rather than to its windmill function.

F14 LETHAM, FIFE

Letham is a long single-sided street lined with estate cottages, at one time for weavers, but probably reconstructed in the later 19th century as the masonry looks newer and repeats large bipartite windows. Opposite a saddler's is a hand pump by Steele's Cupar Foundry that was used to top up a water trough as well as to meet human needs. Note that another Letham exists in Angus, larger, less uniform, but also largely inhabited by weavers.

F15 PITLESSIE OR PRIESTFIELD MALTINGS

2 Cupar Road, at east end of village.

NO 33708 09649

Built in 1870 by R Houston and Paterson; operated by Bothrone's (see F5 and F8). A large three



F15: Pitlessie or Priestfield maltings

storey maltings with three pyramidal-roofed kilns. Converted to housing in the 1990s

F16 CULTS LIME KILNS

NO434 086; NO352 089

Two groups of kilns stand on the hillside in front of extensive excavated workings. Four large kilns, one of them dated 1870, three of them encased in concrete in 1937, and a lime store with battered walls and a big corrugated iron roof. Further east, another stone kiln, two steel-built ones and 20th century crushing plant loaded from the bank above. A narrow-gauge railway connected to this.

NOTE: The charging area above the kilns is not secured against the drop. Take care.

F17 RUSSELL MILL AND STATION, SPRINGFIELD

SW of Cupar, stay on public roads

NO 35296 11967

The largest spinning mill in North East Fife. Founded c.1818 by George Moon, pioneer flax spinner, and operated, from 1860 by Smith, Laing and Co, flax and jute spinning. It closed in 1935. The earlier 4-storey mill has been demolished, along recently with the chimney and workmen's cottages by the entrance, leaving a single-storey north-lit spinning mill of the Dundee type that is now used to make concrete blocks. Water and steam power was employed in combination, and the sluices remain for the turbine that replaced the wheel in 1890. Beside the small railway station, 1847, Jacobean-style, now a house, are the arches of six coal drops.

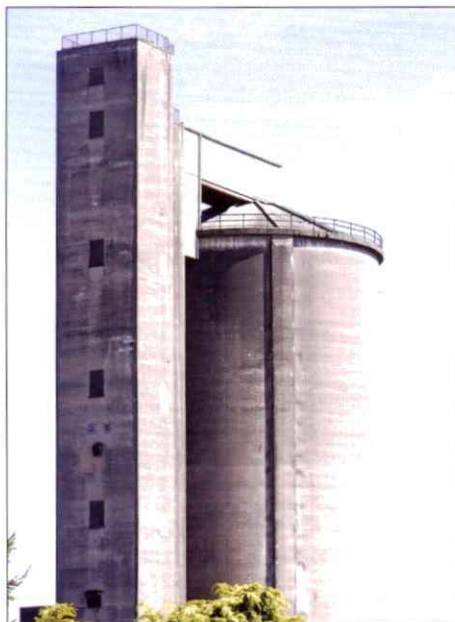
F18 CUPAR STATION AND GRANARY

NO 37665 14313

Cupar station opened in 1847 to designs by Thomas Grainger, an Italianate composition with projecting eaves, a two storey centrepiece and two storey end pavilions. The effect is magnified by lotus capitals to the awning and a semi-elliptically arched bridge with battlements, also by Grainger.

A siding led to an 1840s granary, 4 storeys with arched ground floor openings, converted in the early 1990s into a small business gateway (before that term was used). Adjacent coal drops are to one side (like staithes, using bottom-opening waggons) and to the other the old Jail, 1814, for long a rather grand seed warehouse because it did not look forbidding enough for malefactors. Small wrought iron footbridge, 32ft span, over the Eden at Waterend Road to serve powerloom factories (now demolished) of the 1860s.

F17: Russell Mill sluice, 1890, viewed from bridge, at Springfield



F19: Cupar sugar silo

F19 SUGAR SILO

East of Cupar A91 roundabout

NO 38950 14955

Opened in 1926 by the Anglo-Scottish Sugar Beet Corporation, the Cupar sugar mill was the only processing plant for beet sugar north of the Tyne. In 1935 1500 Scottish farmers supplied beet to Cupar, and then it was that the British Sugar Corporation came together to coordinate the already-built sugar beet refineries to ensure self-sufficiency in sugar, after shortages in WWI, when sugar cane imports were under attack, and to support farmers across Scotland. The silo is a massive cylindrical tower built in 1964. Yet the refinery closed in 1971 and a number of lower buildings around the silo form an industrial estate.

Ref: Oakley, *Scottish Industry Today*, 1937





F20a: New Mills, barley and flax/flour mills at right-angles - kiln to right of tree

F20 NEW MILLS AND DURA DEN

East of Cupar, between Dairsie and Pitscottie

a: New Mills NO4510 4000, on River Eden

Dura Den, centred on NO 5150 1450, Ceres Burn

a) Two adjacent mills to either side of a lade, a 3-storey flax spinning mill of c1830-37 that became a flour mill, and a barley mill that still operated in 1948, parallel to the mill, but stopped in 1950. The narrower end was the kiln, an addition to the original mill, with a small fixed ventilator. Both were converted to houses in 1994, the spinning mill shortened from its original 9-bay length.

Cupar's own corn and flour mills, on the lade SW of the town, were heavily altered in their conversion to flats. Cupar Foundry was next door.

Ref: Anders Jespersen, *Watermills on the River Eden* in PSAS XCVII 1963-4 records the internal workings of both New Mills, and 33 mill locations over 41 km.

b) In Dura Den, picturesque little Ceres Burn drove Blebo mills (two flax spinning mills, one from 1803,



F21: Bishop Brig in Ceres

and a barley mill), Yoolfield and Pitscottie flax mills, Kemback saw and Dairsie corn mill. Blebo Spinning Co and WW Yool & Co were still spinning flax in 1937, the last to do so in Fife, but now are silent and either fragmentary or converted into houses. Yoolfield Crescent forms an attractive curve of single storey millworker cottages. Kemback Bridge is late medieval. Dundee spinner Harry Walker took the name Dura Works (DE6 and DE3) from his mill here, where he was listed in 1837 as Henry Walker, flax spinner.

F21 FIFE FOLK MUSEUM, CERES

NO4000 1140

17th century Tron (weigh house) and two weavers' houses are presented by the Central and North Fife Preservation Society. Bishop Brig, a humped packhorse bridge from the 17th Century is just to the south.

F22 NEWPORT ON TAY, FERRY SLIP

NO 41850 27740

Built 1822 to Thomas Telford designs, to complement that at Craig Harbour, Dundee (DE1). The booking office/ waiting room is by Charles and Leslie Ower, 1880. Now used by the University of Dundee for its marine studies as the Tay Estuary Research Centre. For Tay Bridge see DW15 and for Tay Road Bridge see DD3.

F23 NEWPORT ON TAY, DRINKING FOUNTAIN

NO 42088 28120

A drinking fountain by Walter MacFarlane's Saracen Ironworks, Glasgow. The curved open work roof is particularly difficult to cast. It was repaired in 2011-12.

F24 TAYPORT LIGHTHOUSES

24a NO4468329322 West taller lighthouse

24b NO4510929307 East lower lighthouse

both with associated keepers' cottages.

F25 PILE LIGHTHOUSE

In the Tay Estuary

NO 46323 29325

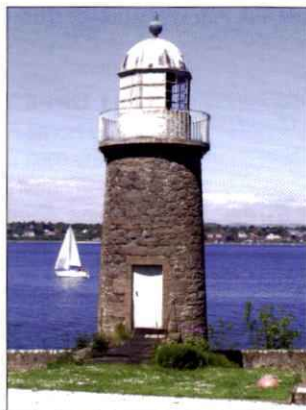
Built 1848 on timber piles.

See illustrations and caption.

F26 TAYPORT HARBOUR AND ICE HOUSE

NO 45829 29098

Rebuilt in 1847 to fit around a central pier that was used by the Edinburgh and Northern Railway RO-RO transfer to Broughty Ferry (DG19) until superseded by the Tay Bridge. The station and associated sheds have been demolished



F24: High and Low Tayport lighthouses by Robert Stevenson, one taller than the other to line up with the navigation channel. Built by Dundee's own Trinity House in 1823. The taller (left) 24m/77ft high tower is whitewashed as a day mark. The lower (centre) 12m/39ft tower has not been lit since 1848 when it was supplanted by F25 (right), built on timber piles by James Leslie. Associated keeper's cottages which with the lights are privately owned.

The ice house for the fishing station can be seen in section because the back was chopped off to form two garages, just west of the harbour (NO 45692 29171).

F27 PRINTING WORKS, TAYPORT

Broad Street

NO 45730 29041

Formerly the Cynicus Publishing Company, the structure is primarily timber and glass to assist compositing, between brick piers. Little panes of glass at the top and iron finials give it a more than totally utilitarian feel. This was built in two or three phases, advancing towards the harbour. A printing works in Kirkcaldy is similar but larger.

F28 SCOTSCRAIG LINEN WORKS, TAYPORT

NO 4650 2770

Founded in 1867, operated since 1880 by Scott & Fyfe Ltd, still weaving textiles for various technical purposes, man-made. Their factory is arranged and extended in all directions so as to conceal (except from the air) the fact that it includes a 19th century slated weaving shed. Brick-built office. A row of company housing tenements stand in front of the factory, with plattie stairs and deck-access to the fore.

F29 GUARDBRIDGE PAPER MILL

Main Street

NO 4507 1953

First recorded as Seggie Distillery, founded by William Haig in 1810. In 1873, the Guard Bridge Paper Company was established. The site (which had its own internal rail network) retains early

19th century masonry, mid to late 19th century brick buildings. The west elevation, facing Main Street, incorporates earlier masonry of the distillery period. At the south end of the works is a long paper machine house (1887), its (older) engine house adjacent. The north part of the site was developed after WW2 with the building of a boiler house (1949), calender house (1952) and a new paper machine range. The esparto boilers were decommissioned in the 1970s. The ash from the coal-fired boilers was tipped into the estuary to create land for expansion. Guardbridge Paper Mill latterly made fine quality security papers, such as for cheques and ballot papers, still using esparto grass. It closed in 2008 and has been bought by the University of St Andrews to develop a 'Green Energy Centre and a Knowledge Exchange Centre for spin-out companies'. To date an artisan brewery has opened on site. Good tenement housing for the paper mill workers was built to the west of the paper mill around Innerbridge Street.

Refs. Malaws, B and McDonald, M *The Last*



F29: Guardbridge Paper Mill ©Crown Copyright RCAHMS

Mill on the Eden: Guardbridge Paper Mill, Fife in Industrial Archaeology Review, Vol. XXXI, No. 2, November 2009, 116-133;

Weatherill, L (1973), One Hundred Years of Paper-making: An Illustrated History of the Guard Bridge Paper Company Ltd, 1873-1973

F30 GUARDBRIDGE BRIDGES OVER THE RIVER EDEN



NO 45188 18877

Built c. 1440 under the aegis of Bishop Wardlaw the four westerly arches are near semi-circular, 38-42 feet span of squared rubble, the easterly arch perhaps the work by Archbishop Beaton, 1532-9, recorded there by his coat of arms. Cutwater refuges are on each pier. Another early bridge is north of the Paper Mill. New three arched bridge by FA MacDonald & Partners. To the north are the circular piers of the branch line from Leuchars to St Andrews, 1852, that supported timber spans.

That line closed in 1969. The former railway station has a Macfarlane's drinking fountain, number 5 pattern.

F31 UPPER LARGO CANAL

Largo Home Farm

NO4213 0363

A short canal dug in the late 15th century, c1495, to allow Admiral Sir Andrew Wood to travel by barge from his castle to Largo Church on Sundays, and to his final resting place. The track of the canal can be seen in the manse garden. However a dig in 1992 did not find any clay puddle to retain water.

F32 LOWER LARGO VIADUCT AND OIL CAKE MILL

NO 41689 02636

Largo viaduct, 1857 four masonry arches on the NBR route to St Andrews, closed in 1964. It makes a strong impression in the small town.

Just north of the viaduct, Largo oil and cake mills operated under David Russell from 1860-1910, then transferred to Burntisland and combined into BOCM Paul. The stone edge runners, 2.37m diameter, 0.54m wide, that ground linseed into oil are preserved as mementoes of the mill in a housing development in 1982. The previous use as a flax spinning mill from 1798 ended in 1842 when, facing bankruptcy, there was a failed attempt it seems by the owner to blow it up with gunpowder.



left, CG1: Bullionfield paper mill
above, CG2: Kingoodie Quarry, socket for wooden crane in quayside, formed in Kingoodie stone

The Carse of Gowrie is the flat plain on the north side of the River Tay between Perth and Dundee, valuable to fruit-growers, for the harvesting of reeds used more to thatch buildings in Norfolk than in Scotland, and for brick fields at Errol and Pitfour that met the area's needs.

CG1 BULLIONFIELD PAPER MILL

Invergowrie, Perth and Kinross

NO3346 7305

18th century lint scutching mill that became a flax spinning mill c1800 and a bleachfield in 1833, water and steam-powered. In 1856 it became a paper mill for Alexander Cowan, of Valleyfield Mill, Penicuik, and was run from 1871 by DM Watson, living in Doubletrees Hotel. Raw materials switched in 1862 from rags to esparto grass, along with jute waste used to line calender bowls. Paper-making ceased in 1964. Main survivor within the complex is a massive water tower with curved corners, looking rather like Drum Castle, giving focus to a housing development.

CG2 KINGOODIE QUARRIES AND PIERS

Invergowrie, Perth and Kinross

East Quarry Pier NO347 295

West Quarry Pier NO340 293

Kingoodie Quarry was geologically and, located by the sea, physically able to supply large sandstone blocks that were especially suitable as engine foundations or for docks like London's East and West India Docks, Dundee's Victoria Dock and Esplanade. But they closed in 1876, to briefly re-open in 1893-1904. A dog-legged pier for stone export is mostly C18th, a top course of ashlar added in 1814 (the date carved on a fallen stone pawl). There is an arched culvert through west pier to clear silt, but the quays are being broken by wave action. The quarries, skirted by the railway to Perth, are filled with water.

CG3 STATIONS ON THE DUNDEE AND PERTH RAILWAY

Inchtute Station NO3287 7267

Errol Station NO 3253 7245

The flat Carse of Gowrie was bisected in 1847 by the Dundee and Perth Railway, taking a direct route rather than conveniencing the various local communities. So the stations became little nuclei in their own right, starting with signalman's houses at level crossings, to observe road and rail traffic, modelled on toll houses and similar to those on

the Dundee and Arbroath railway and then a signal box of c1890. Errol Station is a more substantial building with awnings and a collection of gas lamps marked "Dundee Harbour". This operated as a Railway Heritage Centre and tearoom from 1990-2000 under Errol Station Trust, but is now a private house. Just south of the crossing is a small linen weaving shed partly now in domestic use.

From Inchtute station a branch line in 1849 connected the two miles to the actual Inchtute village at Crossgates, and beyond to a brickworks. A similar branch from Errol to Inchmichael got as far as forming a deep cutting that is now taken by a road because track was never laid there.

CG4 ERROL BRICKWORKS

Inchcoonans

NO2380 23330

One of the last traditional brickworks in Scotland, until it closed in 2008. Two beehive kilns of c1950 and two chimneys survive. Clay was extracted from the pits on the east side of the road.

CG5 BALTHAYOCK BRIDGE

NO17792 23096

A 92-foot span arched cast-iron bridge of 1870, the ribs provided in five sections. The lattice spandrels resemble those at Balgay Park Dundee (DW9) as well as the work of Telford. It was built across a ravine in the hills to serve the now-demolished Balthayock House, a Victorian baronial house designed by James MacLaren of Dundee.



CG4: Errol brickworks, two beehive kilns and a square chimney

© SIHS Eric Watt Collection

The area west of the inner ring road and the Law Hill, Blackness Industrial Improvement Area (NO 38 29), was active in 1981-4 and part of it was designated a conservation area in 1990. The investment has adapted and incidentally conserved an urban textile landscape through conversion, selective demolition and public art. Industry focused early on the Scouringburn (NO 39 30), which was utilised for steam power from 1793, and flows in a culvert from Blackness to the Meadows. The industrial impact was alleviated by Balgay (NO 37 80) and Dudhope Parks (NO 39 30). Evidence can be found of several ropewalks and handloom shops stretching down from Perth Road to Magdalen Green (NO 39 29), a mixed area developed in the late 18th and early 19th centuries. Some tenements sport 'platties' - deck access from stair towers. Many mill owners opted to live on the south-facing Perth Road and Law Hill. The weaving suburb of Hawkhill has almost vanished beneath roads and the University, but another at Lochee still retains its own village identity. At the Kingsway, a pioneering bypass developed from 1919, land was allocated to the new light industries of the 20th century.

DW0 MENZIESHILL WATER TOWER

Yarrow Terrace

NO 3680 3120

1961-3 water tower to serve Menzieshill and Charleston Drive developments. The reinforced concrete tower is perched on piloti that splay outwards and taper upwards.

DW1 PITALPIN WORKS, LOCHEE

Donald's Lane

NO 36970 31915, NO33SE 179

This 1835 flax spinning, fireproof mill was extended to the east in 1851-8. The corner chimney stack was built into the body of the mill and its internal engine house remodelled in 1903. It

withstood a fire that removed the roof in 1990, but awaits a new use. Evidence of handloom weavers windows are visible in a corner building which was subsequently adapted to a warehouse. A further weaving shed was added to the west. An owner's house adjoins the works to the south.

DW2 LOCHEE JUTE WEAVING

Some of the cottages on Liff Road (46-58 Liff Road, around NO 3754 3181) are identifiable as built for domestic hand loom weavers, and there is a



DW0: Menzieshill



DW1: Pitalpin Works, 1988



DW3: Lochee station and (left) corner detail of stonework

former starching loft for weft yarn behind PDSA in Lochee (125 High Street, NO 37910 31613, NO33SE 694). There are jute power loom factories such as Gray Street Works (NO 3730 3188, NO33SE 290, surviving buildings, 1878, replaced a demolished mill founded in 1822) and Caledonian Works, Anderson's Lane, (NO 3744 3172, NO33SE 298), dating from 1874, with a brick-built shed added in 1911, as was Balgay Linen Works (NO 37475 31546, NO33SE 115) when re-fronted by Thoms and Wilkie in 1911 as East Brothers Furniture Factory, South Road. Its office contains stained glass.

DW3 LOCHEE STATION (BURNS CLUB)

Old Muirtown Road

NO 38108 31308, NO33SE 299

This station dates from 1861, built for the Dundee

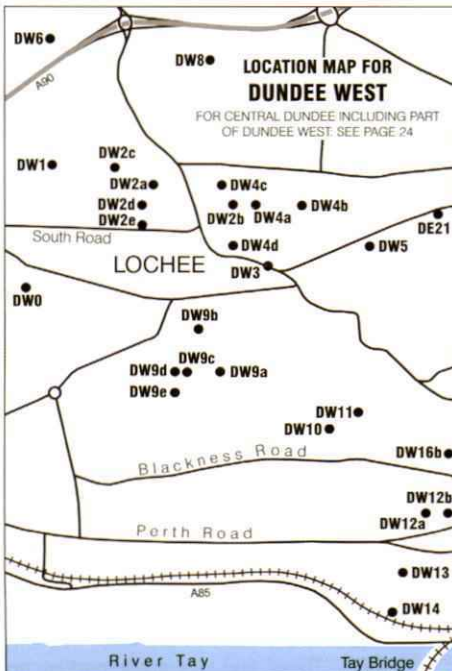
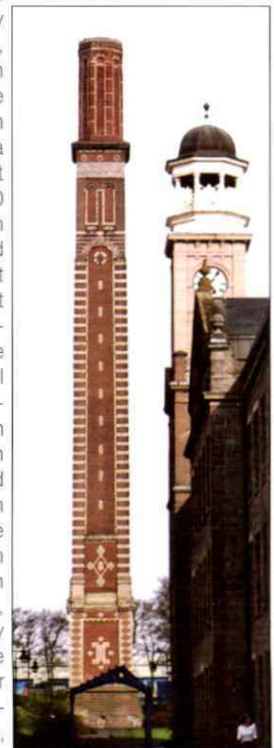
and Newtyle railway, a loop that bypassed the Law Hill tunnel and accessed Camperdown Works via a skew arched bridge over Burnside Street. Architect James Gowans adopted multiple types of stone artfully face-bedded into a projecting grid to a mathematical formula. Other examples of his work are in West Lothian and Edinburgh.

DW4 CAMPERDOWN WORKS

Methven Street, Lochee

NO3808 3168, NO33SE 64.00

Once the world's largest jute works, founded by Cox Brothers in 1850. It grew to carry out every process, and to have its own foundry, machine shop and a branch railway in a 14.16ha (35-acre) site that employed 5000 people. Closed in 1981, it was pillaged by scrap dealers but saved by a project to develop housing and a leisure park. The High Mill (1858-68), is of fire-proof construction with ornate cast-iron roofs, a clock and bell-tower, and twin columns for a large Carmichael beam engine. It has been converted into flats, as has a railway warehouse. The 1863 calendar for cloth finishing became a superstore,



but closed in favour of a bigger one. A Musgrave (of Bolton) beam engine house retains columns entablature and other framework at its corners. Dominating Lochee is the 94m high Cox's Stack (NO 38282 31636), a chimney that concentrated all the smoke from 32 boilers into an Italian campanile of 1865.

The Works Half-Time School (NO 37894 31751), 1884, is now a Boys Brigade hall in Bright Street. Cox's provided Lochee Park (NO 37751 31048), Lochee Baths and Library (NO 37950 31442, NO33SE 265, 1894) and yet did not escape bitter strikes. James Cox lived in Clement Park just to the north of the works.

DW5 NORTH TAY WORKS

Loons Road

NO 38651 31484 NO33SE 673.00

McGregor and Balfour, bobbin and shuttle makers has a 2-storey office by architect Wm Wilson (1938). The office has Crittall windows, deco touches and good timber veneered interior, now let out by the Dundee Industrial Association. Lawside Foundry (LEFCO, NO38630 31425, NO33SE 462) is opposite.

DW6 NCR,

Kingsway

NO 36971 32542, NO33SE 102

Timex, like NCR was part of an American investor in Scotland after World War II in 1946. NCR became the biggest employer in Dundee (6,500 in 1970 when preparing for decimalisation), supported the NCR pipe band, and had playing fields, tennis courts and a bowling green between Camperdown Park and its first factory. An ice rink has taken the place of the factory, but the boardroom, containing a mural dedicated to Scottish industries, is obstinately hanging on. Further factories were added in 1949, 1952, 1961 and 1963. ATM manufacture continues elsewhere, but

research and development is still in the city, in a new building for NCR with a steeply pitched roof by J F Stephen, 2007.

DW7 TIMEX WATCH (JTC) and OLIVETTI FACTORY

Harrison Rd

NO 37159 32964 NO33SE 101

One of two factories, with NCR, built to attract American investment in the immediate wake of WWII. Watch production started temporarily in a farmhouse in 1947 and switched to the new factory in 1948. This very long factory with clean horizontal lines on the brow of a hill, was designed by Bennet, Beard and Wilkins and built of stock brick. Here, and in two other factories at Milton and Dunsinane, 1500 employees in the early 1960s increased to 2500 in the 1970s, mainly women. Timex was the largest domestic supplier of watches to UK, and yet exported 90% of its products. Timex also developed with Sir Clive Sinclair the Sinclair C5, his flat screen TV and other light engineering products. After a long strike in 1992 it was sold and now makes kitchen units. Just to the east is **OLIVETTI** by Edward Cullinan, 1971 (NO 373 329). The office is primarily a sloping roof standing on piloti.

DW8 DUNSINANE INDUSTRIAL ESTATE

Kingsway

NO 3782 3238, NO33SE 626

The Kingsway is a pioneering dual carriageway by City Engineer James Thomson, 1919-1933. It boasted a central tree-lined boulevard, a tramway and traffic circus (roundabout) at Strathmartine Road. It now carries the A90, and many more roundabouts.

Interwar and post war factories were directed here but are diminishing in number. The biggest, Valentine's (for greetings cards, originally established in Perth Road; Kingsway West, NO 3765 3256, NO33SE 132) has been demolished within the Dunsinane Industrial Estate.

DW9 BALGAY PARK

Three parks in one: Balgay, 'the People's Own Park', opened in 1871 (NO 3785 3075, NO33SE 540.00), Lochee, gifted by Cox Brothers (NO 37751 31048, NO33SE 452), and Victoria Parks, plus the Western Necropolis and Mills Observatory - a Victorian 10" refractor telescope by T Cooke, York, in a 1935 papier mâché dome by Grubb Parsons, Newcastle, (NO 37707 30769, NO33SE 540.03). The only comparable dome by that firm is in Toronto. These last hills are joined by an



DW7: Olivetti Factory, 2012



DW9: *Balgay Park*

elegantly arched cast iron footbridge of 1873 (NO 37605 30745, NO33SE 540.01) with Telford-style crossed braced spandrels designed by George Hird, Burgh Engineer's Department. The bridge was refurbished by Dundee City Council in 2005-8. A bandstand pavilion of 1877, damaged by fire in 1993 was reconstructed as an open-air pergola in 1997, the better to show its original (Saracen?) iron spandrels (NO37635 30652, NO33SE 540.02).

Ref: *The Treasures of Balgay* (2010)

DW10 LOGIE SCHEME

Scott Street / Logie Avenue

NO 38 30, NO33SE 0.05

The first municipal housing scheme to take advantage of the 1919 Housing Act as stated on a



DW11: *Scott Street, Dundee*

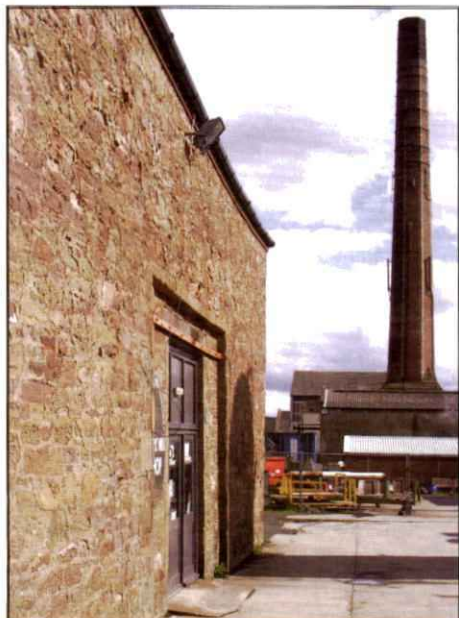
plaque at a viewpoint. The Logie Scheme adopted a garden suburb layout of 4-in-a-block houses with central heating plant and communal laundry on Scott Street. It is a conservation area.

DW11 SCOTT STREET WORKS (McGREGOR'S)

Scott Street

NO 38580 30520, NO33SE 225

Linen canvas weaving factory, 1875, specialised in hose pipes and was remodelled in 1920 by Thoms and Wilkie, Architects. It later became Lord Robert's Workshop for war wounded. Converted to housing c. 2006.



left, DW12: *Baltic Works*

DW13 *Seafield Works, 1987, built for Thomson Shepherd in 1859-61 by Robertson & Orchar.*





DW15: Close-up view of a pier on the Tay railway bridge from near the middle; on the right, one of the remaining bases of the original piers

DW12 BALTIC WORKS, (‘THE FABRIC MILL’)

Annfield Road

NO 38965 29949; NO32NE 18.00

This 1873 jute spinning mill, for Hardie & Smith, now Halley Stevenson’s dyeworks, has a polychrome octagonal chimney (1864, look for the mobile phone antennae) and gothic cast-iron roof by Pearce Brothers, engineers. The associated weaving shed (1864) stretched south to Hawkhill, demolished like Caird’s larger Ashton Works, alongside to the east (NO 39100 30000, NO33SE 88). The mill shop gives the chance to see inside a raw jute warehouse.



20 DW15: Tay railway bridge with the remaining foundations of the first bridge to the right.

© SIHS Eric Watt Collection

DW13 SEAFIELD WORKS,

Shepherds Loan, Taylor’s Lane

NO 38819 29600; NO32NE 19.00

This jute carpet factory, founded c1850 for Thomson, Shepherd and Co by Robertson & Orchar, engineers, has a 5-storey spinning mill (dated 1861) with central double engine house adjoining a weaving shed built in 1859. Closed in 1986, it was converted to housing, with a swimming pool in the former press-packing/ mechanics’ shop. It has an arched cast iron roof, similar to that over the boiler house, now an open pergola.

DW14 BANDSTAND

Magdalen Green

NO 38787 29434 NO32NE 169

By Walter Macfarlane, Saracen Foundry, Glasgow, 1889, refurbished 1991.

DW15 TAY RAIL BRIDGE

View from Riverside Drive Dundee or Wormit, Fife (B946)

The first Tay Bridge (NO 39162 27844, NO32NE 17) was a single-track lattice-girder bridge designed by Sir Thomas Bouch, proponent of the idea that contemporary structures were over-designed. Built in 1871-8 it was at two miles the longest bridge in the world at that time. It is axial to Cox’s Stack, and James Cox was a principal funder. On December 28th 1879 a force ten gale brought down the high girders and a train carrying 75 people plunged into the River Tay. The Inquiry into the incident blamed insufficient cross-bracings and fastenings, but the design meant its fall was inevitable. The stumps of the old piers remain visible downstream as eloquent reminders of the cost that can come with engineering advance.

The engineers for the new bridge (NO 39143 27850, NO32NE 11), W H and Crawford Barlow, and the principal contractor, Sir William Arrol and Co. Ltd., transferred 118 old girders upstream to new arched wrought-iron plate piers, twice the width of the old bridge. Completed in 1887, the total length of the new bridge is 10,711 feet (3,265m). The bridge slopes down from a signal box at Fife to Dundee, threading its twin tracks through 13 hog-back trussed navigation spans, and then curves gently to give a prospect of the city, crossing Riverside Drive on arches, passes the closed Esplanade Station, then descends on fish-bellied trusses and brick arches into a cutting. In 2000-2003 local strengthening was achieved by mechanically fixing 16mm thick plate to parts of each girder and shock absorbers to the curve.

Ref: Lewis, P. R., ‘Beautiful Railway Bridge of the River Tay’, Tempus 2004

DW16 LOGIE WORKS/ EDWARD STREET MILL

Brook Street, Edward Street, Milnbank Road

Logie Works (NO 39172 30402, NO33SE 61)1828-33, consists of long, iron-framed spinning and hackling ranges by Umpherston and Kerr for A & D Edward. These converge on a coffin-shaped courtyard linked by a trussed wrought-iron bridge. Two beam engine houses, boiler houses and a square tower at the west end. In the 1990s it was converted to housing. The associated damask power loom factory, Edward Street Mill (NO 39078 30357, NO33SE 66), was built in 1851, has a 4-storey fireproof front, wrought iron roof and long cast iron colonnade opened out into a weaving shed, its looms driven from below. The 1890 vertical engine house is now a nursery and a cloth warehouse of c.1860, now a coffee blenders', beside the Factory Manager's House. The works split up after Edward's ceased trading in 1889, and the weaving factory became a spinning mill for John Sharp, converted to housing in 2004-6 by Cleghorn HA. His house in Fife, Hill of Tarvit, is an NTS property.

DW17 JUTE MILLS IN SCOURINGBURN

Brook Street / Douglas Street / Anchor Lane /West Henderson's Wynd

(a) 4-storey Walton Works, (NO 3917 3033, NO33SE 78) 1889, J N Kyd, projecting rope race, spun jute and is now flats, as is (b) Burnside Works, Mylne's East Wynd (NO 39318 30370, NO33SE 79), 1874 (note Polonceau tie roof in north gable). It made brattice cloth for coal mines. (c) Queen Victoria Works, Brook Street (NO 39263 30431, NO33SE 83), 1828/1887, ceased jute spinning in 1995. (d) South Anchor Mill, Anchor Lane (NO 39432 30348, NO33SE 272), c.1850, has an arched cast-iron roof, engine house, and weaving shed.

Dundee Industrial Association provides common services for small businesses and artists in buildings amalgamated by J F Robertson: (e) Douglas Mill, Douglas Street, (NO 39351 30442, NO33SE 114) -1835, later made fireproof with arched cast iron roof; beam engine house whose foundations are viewable from the stair and (f) Meadow Mill, West Henderson's Wynd (NO 39438 30444, NO33SE 62), an 1874,5-storey fireproof mill by Urquhart Lindsay, Blackness Foundry. A WWII fire-watchers shelter



DW16 Logie Works in June 1947 (U-plan mill) and anti-clockwise from the big foreground chimney DW17 (a) Walton Works, (b) Queen Victoria Works, (c) Burnside Works and (d) South Anchor Mill near the smoking chimney of West Dudhope Mill, the smoke travelling over (e) Douglas, (f) Meadow Mills and (g) South Dudhope Works, Park and Grove Mills.

DW18: Verdant Works, Dundee, in 1994, showing the brackets for the horizontal driving shaft from the engine, and subsidiary pulleys for the hoist. Its condition is now poor, but a start will be made in transforming it after a stage one pass by HLF.



is on the roof. Now WASPS artists' studios on top three floors. (g) South Dudhope Works, Douglas Street (NO 3940 3054, NO33SE 77) -1865, the last steam powered factory in the city, its engine stopped in 1966 see Hay, Stell, *Monuments of Industry*, 1985:

DW18 VERDANT WORKS (MUSEUM, DUNDEE HERITAGE TRUST)

West Henderson's Wynd, Milne Street
NO 3952930369, NO33SE 80

This flax and jute spinning mill of 1833, with timber floors on columns with brackets for horizontal drive shaft, has a gothic mansard cast-iron roof of 1852. Closed as a flax and jute spinning mill in the 1880s, the site was then used to process textile waste, flock, rabbit skins and scrap metal. Dundee Heritage Trust acquired the site in 1991. Textile machines from the Dundee College of Technology are operated for visitors. The lodge and office furnishings are exactly as left by the previous occupiers. The Scouringburn culvert runs diagonally under the site, supplemented by an artesian well. Engine house, boiler house (three arches) and corner stone - and brick-built chimney. Ring of gas holders below SW corner. Milne Street Mill is Verdant Works car park (NO

39569 30400); its weaving factory now fronts an indoor skateboard park, and north of that c.1860 raw jute warehouses, Douglas Street. Oriel window lights the office of John Sharp (see DW16).

DW19 WEST WARD WORKS

Guthrie St/ Blinshall St
NO 39562 30340, NO33SE 693

D C Thomson printing works, 1959 and 1960s by T Lindsay Gray, envelope an 1871 weaving shed (NO 39550 30326), and a well below the floor. On the site of the first fireproof mill in Dundee, dating from 1806 (Bell Mill, NO 3959 3031, NO33SE 283). Printing ceased in 2010. Courtyards opposite of early 19th century raw flax warehouses (NO 39567 30281, NO33SE 545) are converted to student housing as Keiller Court (no connection to the jam-makers). The gable of an early 19th century house typical of the area is impressed into the south wall, Blinshall Street.

DW20 DUDHOPE WORKS (FERGUSON'S)

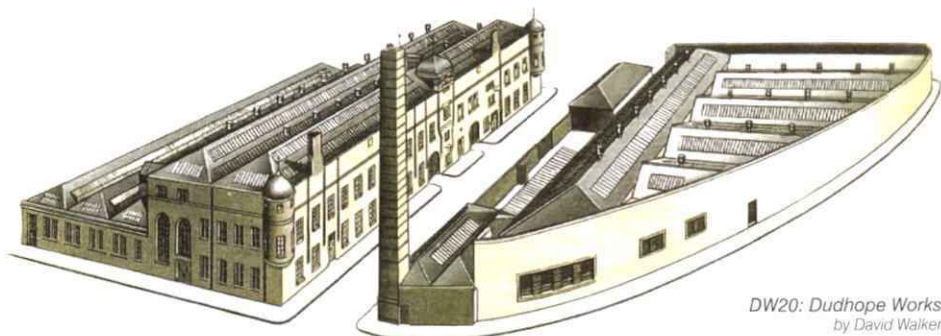
Douglas Street
NO 39700 30520; NO33SE 75

Chimney of 1837, the oldest free-standing chimney in the city is connected by a flue under Douglas Street to a weaving shed of 1837. A new

right, DW19: W Ward Works, paper/flax warehouse, before conversion



DW22 Ward Foundry in snow 2003, with South Mills DW21 beyond and Milne St Mill DW18 offices and warehouse in front.



DW20: Dudhope Works
by David Walker

factory was built in the curve of Lochee Road in 1950 (NO 39670 30588). An intervening turreted block of 1892 is now a carpark. Further west on Douglas Street, north side, there is a TA Hall (NO39639 30552); the courtyard-plan Henderson's leatherworks (Dudhope Tannery, NO 39620 30549) made straps for looms and driving belts.

DW21 EAST AND SOUTH MILLS (FLAX)

Guthrie St/ Session St/ Brown Street

East Mill (NO39663 30316, NO33SE 68), Guthrie Street, was built as a tannery in 1792, and was converted to flax spinning in 1799, engined by Boulton and Watt. Owned by J & W Brown from 1809 (J R Hume, *Early Days in a Dundee Mill*, 1980), it is the oldest steam-powered mill in Scotland, with Y-columns to carry the driving shaft. For the same firm, now O G Miller, Wm Brown's son-in-law, South Mills (NO 39720 30255, NO33SE 81), Session St, (1825), and Brown Street, (1850s, 1864 and 1875, dated pediments). This fireproof, high mansard, gothic cast-iron roof mill was converted to flats by Cleghorn Housing Association in 1999-2000. Note cast iron colonnade to the courtyard.

DW22 WARD FOUNDRY (CARMICHAELS)

Brown, Guthrie, Milne and Session Streets

NO 39658 30353; NO33SE 233.00

Established in 1810 by J & C Carmichael to make

steam engines. On Milne St, a corner boiler shop of 1851-6 and a moulding shop, 1883, with big bressumer to the back. The new boiler shop, c1880 with a riveting tower and I-section stanchions to the rear, runs up Blinshall Street, in place of Douglas Foundry (NO 39620 30370, NO33SE 233.01; set up by millwright cousin Wm Umpherston in 1827 to build fireproof mills). The smiddy was in the buttressed building in Brown Street. As steam hammers cracked the sand moulds these had to transfer to the Dundee Steam Forge, two blocks to the north (NO 39593 30600, NO33SE 625). The offices are on Guthrie Street. Closed in 1929 and used for paper storage by D C Thomson, it is in various uses on Brown Street, and now has a mosque in its midst. James Carmichael invented fan blast and reversing gear for paddle steamers. His statue is in Albert Square.

DW23 TAY WORKS (GILROY'S)

Marketgait/ Brown Street

NO 39768 30432, NO33SE 63

and NO 39790 30350 NO33SE 74

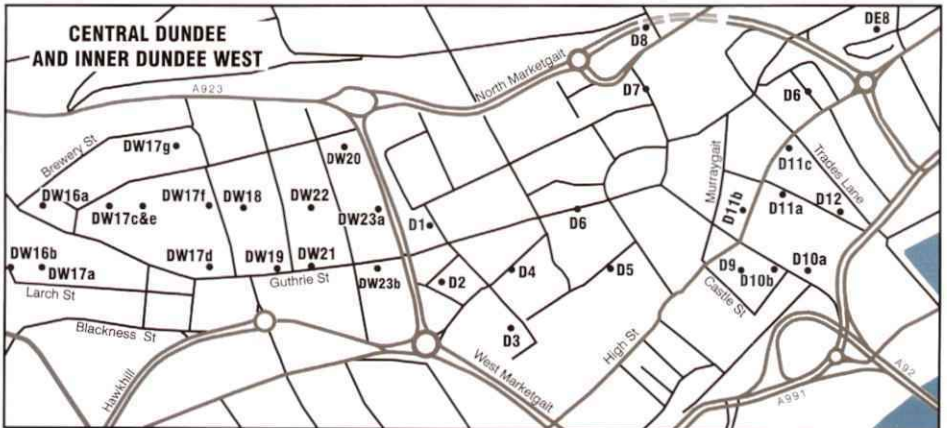
These long and perfectly proportioned neo-classical ranges for jute spinning and carpet weaving were built in 1851-65 by reconstructing earlier mills. A giant pediment incorporates the initials G R & A Gilroy and the higher pediment sported a statue of Minerva. Behind this is a gothic cast iron

below, DW21 East Mill in 2000, viewed from South Mills with beyond, West Ward Printing Works DW19, and boiler riveting tower of Ward Foundry DW22



roof, while the rest of the roofs are of wrought-iron ties. They are now Student Residences. To the rear is the fireproof L-plan Hospital Ward Mill (Old Mill, NO39741 30379, NO33SE 581) of 1835-6, and a beam engine house of 1851 for a weaving shed (and other engines were within the multi-storey mill). A brick and concrete Dyeworks, 1922, performed much of the dyeing for Jute Industries Ltd, and south of Guthrie St is Tay Calender (NO 39796 30304, NO33SE 73; now Travelodge) and a cloth warehouse of 1881.

right, DW23: Tay Works, Dundee; below right, DW23: timber sash windows of Old or Hospital Ward Mill at Tay Works, 1836, the engine house stair; below, DW22: Ward Foundry Boiler shop and Dundee Mosque on right



Medieval Dundee had its street layout cut through in the 1870s-1880s by a scheme of slum clearance to create Commercial Street, Whitehall Place and Crescent. This consisted of uniform French-style tenements over tall cast iron columns and bressumers to shop fronts, given different kinds of a flourish by eye-catcher corner towers. Destruction in 1930 of the Town House and redevelopment in the 1960s of Wellgate and Overgate help explain current favourable attitudes towards conservation of what is left in the city.

Of the eight spinning mills within the area, on the west and northern fringes, just one survives. Chapelshade Works of Bell and Balfour (NO 40087 30593) was where jute was tried and is appropriately where Abertay University stands today. Formerly Dundee College of Technology, it provided training world-over in jute technology. Of five calenders for finishing cloth clustered in the SE corner between the commercial district and the docks, two survive, sympathetically converted, and just one of the lanes where raw jute was stored and previously whale oil was processed (East Whale Lane). Of four whisky bonds, on the other hand, three survive in a cluster at Seagate. Another group of warehouses were for iron wholesalers around Exchange Street.

Electric power: all fabric of the first and second generation power stations have gone. The city's first electric generators, steam engine-driven, were in 1899/1901 at the tram depot north of the Police HQ, Marketgait, previously a prison. They had a tall chimney. A network for hydraulic power is found in warehouses near the docks, latterly at least operated by mains water pressure.

D1 GIRLS' INDUSTRIAL SCHOOL

Courthouse Square

NO 39854 30369, NO33SE 196

This gothic towered building dates from 1855. To be sent here was more or less a result of misdemeanors, until that function moved in 1896 to a larger building on Blackness Rd. Later it was simply a hostel that gave accommodation to the women who dominated the jute workforce, owned from 1900 by the Salvation Army.

D2 LINDSAY STREET MILL

North Lindsay Street

NO 39887 30278, NO33SE 137

1874, by architects McLaren & Aitken with superb

French gothic tower, the detailing now abraded. Extended to West in 1881, the mill is fireproof except for timber roof trusses. The engine house in the yard has an arched-braced roof. It is now a pub, flats and Fat Sam's night club.

D3 DUNDEE HOUSE / HALLEY'S HACKLE WORKS

North Lindsay Street

NO 39986 30222, NO33SE 220

1911, by Harry Thomson, extended 1914. 4-storey with Diocletian windows. This works made pins for textile machinery, then stored ink and paper for newspaper printing, and is now Dundee City Council HQ, by Reiach and Hall, completed 2011.



D1: Girls' Industrial School and Courthouse Square



D3 Dundee House, left, and D2 Lindsay Street Mill

There is a striking glass addition to the roof and radial rear extensions.

D4 WARD MILLS/FRIARFIELD HOUSE

Barrack St / Willison St / S Ward Rd
NO 40010 30250, NO43SW 294

Don Brothers, Buist & Co offices, built in 1873, incorporated a works canteen and high level of renaissance architectural treatment, with curved corner. Excavation has revealed the engine foundation and condenser of the 1820s Barrack Street Mill that preceded this building (NO33SW 163). Raw jute warehouses line the north side of South Ward Road (NO 39998 30297). The two spinning mills were demolished in 1964. Foundations of a large beam engine house (1885, one of the last built)



D4: Ward Mills

show the bolts threaded through big ashlar blocks in its outer walls to Willison Street. The weaving factories were in Forfar (see AN16-17), where Don & Low PLC are still important in producing technical and non-woven textiles.

D5 DUNDEE ADVERTISER PUBLISHING HOUSE

Bank Street
NO 40199 30325, NO43SW 521

The full length of the north side of Bank Street was taken by the publisher John Leng, Dundee Advertiser. A unity of architectural style belies phased construction, from 1859-1890. On the north side square chimney stack and a little belvedere turret, the inside lined with tiles. The rival D C Thomson and Co. eventually bought and combined the Leng titles, named on a frieze, and had a printing works opposite, replaced by a multi-storey carpark. The street surface is of wooden setts, showing from time to time through the tarmac. These prevent harm to typecases, should any be dropped.

D6 COURIER BUILDING

Ward Road/Meadowside
NO 40152 30428, NO 43SW 371

D C Thomson's publishing HQ is in true American style, built 1904-6 by Niven and Wigglesworth. The first Scottish use of Hennebique reinforced concrete was here in 1902, to pile the soft Meadows. A tube allowed messages to be sent by compressed air to and from Bank Street. A 9-storey tower by T Lindsay Gray in 1960 continues the American proto-skyscraper theme. The adjacent General Post office (Ward Road/Euclid Street, NO 40082 30410, NO43SW 281) has closed but is proposed to be adapted by Dundee High School (Euclid Crescent), whose playground gave inspiration for the Bash Street Kids in *The Beano*.



D6: Dundee Courier, detail

D7 OFFICE OF COX BROTHERS/ JUTE INDUSTRIES LTD

Meadowside

NO 40239 30634, NO43SW 282

This 1883-6, Italian renaissance style building, far from the works in Lochee, was connected by telephone from the 1880s. It was expanded in the 1920s as HQ of conglomerate Jute Industries Ltd.

Other jute company offices were smaller, and much business was transacted in the street, or from offices in Cowgate or King Street, in shared premises like Mercantile or India Buildings (Victoria Road) just west of Cox's, the Chamber of Commerce or adjacent jute exchange (replaced by Royal Exchange Buildings, 1956).

D8 VICTORIA BREWERY

16-20 Victoria Rd

NO 4025230712, NO43SW 243

Established in 1876 by Mrs Margaret Wills of Dudhope Brewery (to its rear, in the line of the ring road), it was designed to form part of an Improvement Act Street. Brewing ceased before 1914 and the 5-storey tower brewery became a tenement. The wort coppers were on the second and third floors; the cooler was above two arched windows to their left, what is now the Ladywell Tavern.

D9 CASTLE FLOUR MILL / CASTLEHILL BOOT FACTORY

Rear of 34 Commercial Street

NO 40485 30279, NO43SW 857

Dating from c.1820, this mill straddles the Tod Burn as it exits from the Meadows towards the sea, so may have had a small wheel. A steam engine is shown in the 1856 O.S. Map. An 8-storey building rises from the Castle rock. The Town of Dundee had its own flour mills at Mill o' Mains on the Dighty, a more reliable water power source. From 1887, the mill buildings became the Castlehill Boot Factory, (300 employees of Owl and Co.) and later was a seed and tea warehouse.

D10 EXCHANGE STREET WAREHOUSES:

Commercial, Castle, and Exchange Streets

Ironmongers' warehouses: (a) **CRABB'S**, 7 Commercial Street (NO 40561 30293, NO43SW 220), is plain on the outside, but had a hydraulic lift and a light well served by a travelling crane under a Polonceau roof. (b) **IRON WAREHOUSE** of George Stephen, ironmonger (founded 1814; NO 40473 30294, NO43SW 722), accessed through a pend from 20 Commercial Street, has a hoist ga-

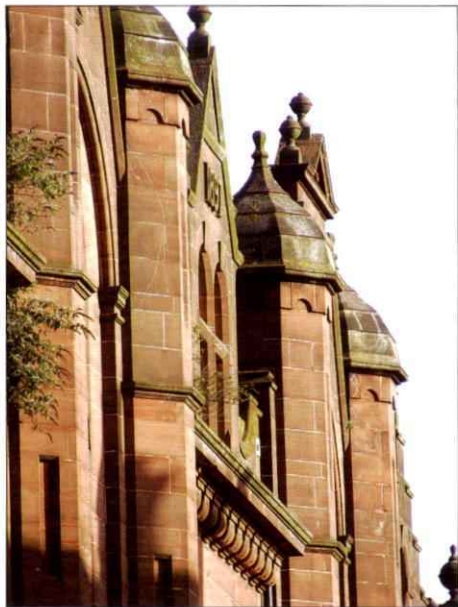
ble. Stephen's shop, 29 Castle St, has ornate columns within it. (c) A similar gable serves Hume's Ships Biscuit Factory and warehouse of 1868, both now flats. Two more warehouses of 1868 in Exchange Street (d), where steel stockholders Brown & Tawse Ltd were founded in 1881) were demolished in 2000, and archaeology revealed a series of vaulted tunnels beyond these that could only have been accessed by boat. Possibly a source of income for the Provost Riddoch, 18th century merchant smuggler and land owner in that area? And why those extremely well-finished ashlar arches in such an out of the way place, now seen inside out from the car park over those vaults, hard against Castle Flour Mill? Yet to be uncovered is a graving dock by Smeaton reported to underlie buildings, perhaps beside or below the vaults of the Exchange Coffee Rooms, 15 Shore Terrace (1828; NO 40484 30198, NO43SW 323).

D11 WHISKY BONDED WAREHOUSES SEAGATE

D11a Yeaman / Stewart's Bond, 81 Seagate/Candle Lane (NO40526 30435, NO43SW 208). This 1868 Italian renaissance style-building was converted to flats c.1980. Stewart's Office in 40 Castle Street is an enigmatic single door opening into an elaborate interior by Frank Thomson, 1919. Bottling of Stewart's Cream of the Barley took place here and on Kingsway.



D10: Exchange Street Iron Warehouse and D9 Castle Flour Mill



D11b: Robertson's Bond.

D11b Robertson's Bond, 38-40 Seagate (NO40455 30412, NO443SW 142). This 1897 vigorously-turreted Jacobean-style concoction, was a print-makers' workshop until its transfer to DCA. Opposite, another of Robertson's bonds (Seagate/ 2-4 Candle Lane; NO 4051330452, NO43SW 982) was rebuilt in brick, timber and cast iron in 1907 following the spread of fire from Watson's Bond, later a part of Watson's Bond and now converted to housing.



D11c: Robertson's / Watsons Bond under conversion, during 1995

D11c Watson's Bond 99 Seagate (NO 40529 30507, NO43SW 108), was rebuilt in Hennebique ferro-concrete after a major fire when flaming whisky ran through the streets from which some passers-by succumbed. Closed in 1988, it was converted to 84 flats in 1995-6 by cutting back the great depth of three buildings, retaining their structure as well as brick elevations. Watson's "Number 10" achieved large sales in Australia.

D12 THE SAILOR'S HOME / CHAPEL

62-63 Dock Street

NO 40656 30367, NO43SW 405.00

This 1879-81 building is an eye-catcher from Victoria Dock. The names of great sailors are carved into the parapet. The cast-iron, sun-burst motif may be an echo of one at Liverpool sailor's home. It could accommodate 80 sailors and had its own Chapel (gable in the lane behind). Now renovated as housing, by Unicorn Properties. Nearby are ships' chandlers and the offices of



D12 Sailor's Home



D11c: Watson's Bond Trade's Lane, 1990

the Dundee Perth and London Shipping Co, also built in 1881.

D13 DUNDEE CALENDER AND 'SEA CAPTAIN'S HOUSE'

48-50 St Andrews Lane

NO 40549 30606, NO343SW 184

A Regency villa and the first calender in the city (1822, for applying glaze to linen cloth), it had a true vertical steam engine which has left the trace of its flywheel in a Cowgate wall. Both buildings were conserved as a training centre for the charity Helm by Tayside Building Preservation Trust in 1996. A hydraulic lift, operated from the water mains, was made operational as part of the project. Other calenders operated nearby at Queen Street, Cowgate and Trades Lane Calenders -now the bus station. Warehouse walls survive in Mary Ann Lane, and a carved head keystone, at Trades Lane. Calenders were so placed to be near the port and railway for onward dispatch of finished cloth.

D14 CO-OPERATIVE GROCERY WAREHOUSE / MAGNUM HOUSE

138-140 Seagate

NO 40630 30629, NO43SW 408

The Scottish Co-Operative Wholesale Society (SCWS) premises concentrated around Seagate, and the main reminder is a block built in 1934 by Co-op architect Cornelius Armour. Note the Crittall windows and galley prow. Converted to flats in 1992. Other SCWS warehouses nearby include a single-storey range bearing a clock, 1914. A sugar refinery (c.1790-1820) on both sides of Seagate is recalled by Sugarhouse Wynd, and there was a brief attempt to operate a glassworks near here (the glass cone is represented in the Dundee penny, 1799).



D13: Dundee Calender

Dundee's oldest docks, King William IV (NO 40604 30182, NO43SW 1002) and Earl Grey Docks (NO 40481 30026, NO43SW 515), on which the engineers Smeaton and Telford worked, were infilled to receive the Tay Road Bridge. Thomas Telford's leading (and leaning) light marked one of the entrances, 1827 the rear of a pair that marked a route clear of Beacon rock, but has now been moved. The two wet docks (Victoria and Camperdown Docks), having been declared no longer port-related, benefit from a masterplan for development and a complimentary conservation plan written by Tayside Building Preservation Trust.

DD1 TAY BRIDGE STATION / DUNDEE STATION

South Union Street

NO 4016 2974 to NO 4035 2991

Built 1887-9, this island platform in a cutting is given some presence by 2-storey brick and stone offices/ waiting rooms (now let as recording studios for noise-loving musicians) and is linked by iron and glass bridges to Riverside Drive. The 1959 booking hall has been re-clad to no good effect. It will be rebuilt. The North British Railway used this through station to traverse Dundee via tunnels that skirted the Docks, cast iron beams now replaced, inverted arched sides to tunnels and cuttings. The rival Caledonian Railway obliged passengers to trek between East and West Stations: a handsome Scots Baronial terminus that was at the foot of Union Street and an arched train shed near Victoria Dock. Both of these are demolished.

DD2 CRAIG HARBOUR

NO4046 2985, NO42NW 157

Built 1821, and by Thomas Telford, this wedge-shaped harbour was built to shelter the Tay Ferries to Newport. The ramp has been levelled to accommodate RRS *Discovery* and a caisson was built in concrete across the mouth of the harbour. An annex to the V & A will project into the Tay at this point, the former site of the public swimming baths.



DD1: Dundee station, 2012

DD3 TAY ROAD BRIDGE

NO 41564 29456, NO42NW 75

Completed in 1966 by W A Fairhurst, the bridge is built of twin steel hybrid box-girders with high tensile steel to the lower part of the box girder. These were fabricated by Caledon Shipbuilding and Engineering Co, with Sir William Arrol, and stand on elegant twin chamfered piers. A version of one on the Fife roundabout (south end of bridge) shows their taper from top to bottom. There are 38 simply-supported spans of 25m at the ends, widening to 55m at the middle, giving the optical illusion of equal spans as far as mid-point, and four continuous spans over navigation channels (protection added to those piers in 2012). Two viewing platforms, cantilevered over the roadways, and the toll booths, have been removed, and the approaches within Dundee are being altered to eliminate the roundabouts and overhead walkways that were a feature of



DD3: Tay Road Bridge, looking towards Dundee

© SIHS Eric Watt Collection

Craig Harbour, King William IV and Earl Grey Docks, West Graving Dock (see Telford Atlas), entrance to Patent Slip and part of Victoria Dock in 1927.

Buildings shown, left to right, includes Caird Hall (Jute money), St Paul's Cathedral, Victoria Arch, Municipal Baths, Customs House and Arctic Tannery.

Crown copyright, RCAHMS



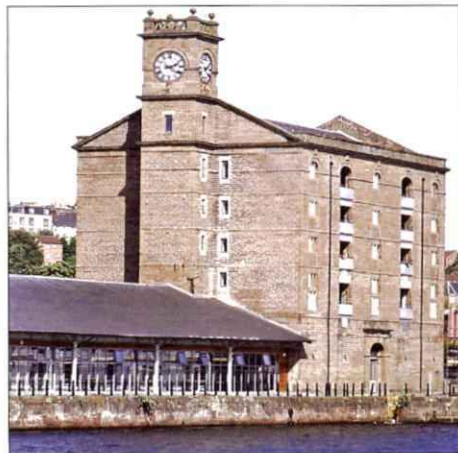
that area. The bridge carries around nine million vehicles per year.

DD4 CUSTOMS HOUSE AND HARBOUR CHAMBERS

Dock Street

NO40680 30319, NO 43SW 481

This Ionic-style public building combined functions to give it more presence than, say, Glasgow's Customs House. It was built in 1842-3 by James Leslie, engineer for Dundee Harbour Board, with John Taylor, HM Customs. Rich carved detail in its pediment was restored by Graciella Ainsworth. Extended in 1884 and 1936, it awaits a new use.



DD5 VICTORIA DOCK (CITY QUAY)

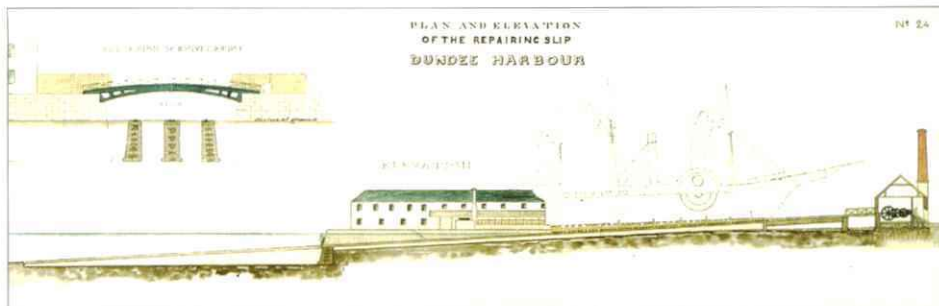
Camperdown Street

NO 40958 30366, NO43SW 89

Land reclamation began in 1833 with formation of a south breakwater, Marine Parade. The 10¾ acre wet dock was completed in 1869-75. A retail, housing and leisure development is underway by Forth Properties Ltd, to a conservation plan and masterplan. Victoria Dock is lined on its north side by transit sheds for the rapid transfer of goods like jute. The north face is of large bricks with regular ashlar-framed openings for security while the dock side was a continuous series of sliding doors between cast iron columns that double as downpipes bearing the face of the harbour engineer (David Cunningham had just



DD4: Customs House and Harbour Chambers, and (left) DD5, Victoria Dock



DD6 patent slip, by James Leslie CE

GD-DH13 C-PageD43. © Dundee City Archives

succeeded Charles Ower). The roofs of wrought iron trusses curve down where each party wall has settled into the made-up ground. The sheds are adaptively re-used, an extension made into the dock to allow shoppers to cross two sides of a street. At the east end, Clock Tower or Harbour Warehouse (NO 41113 30533, NO43SW 89.07) is a tall iron-framed granary of 1877, now loft apartments. A prominent clock tower at one end and a lift shaft at the other gave the opportunity for a new set of balconies. The columns have dividers for loose bulk goods at upper levels on substantial Hodgkinson beams.

DD6 HARBOUR WORKSHOPS, PATENT SLIP AND PANMURE YARD

Marine Parade

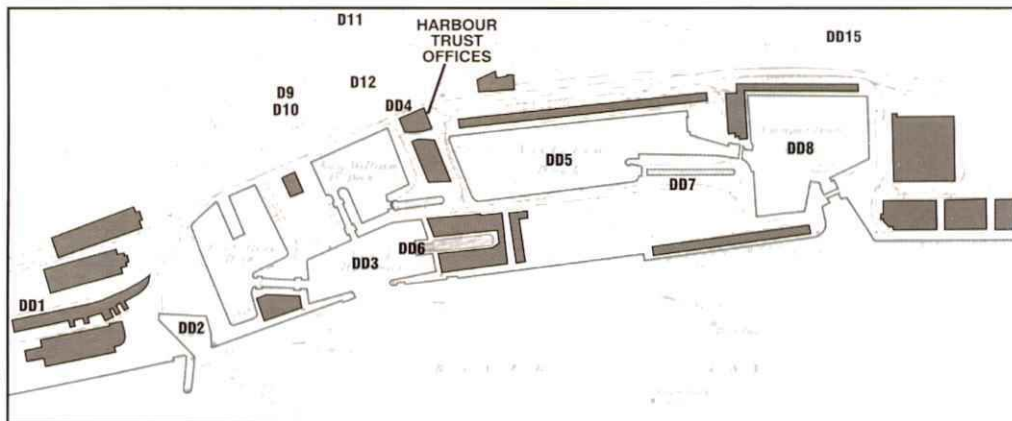
Reclaimed ground between Victoria Dock and the sea contains the Harbour Workshops and steam-hauled patent slip, built 1837. The still-visible upper part of the 545-foot ramp (NO 40870 30181, NO43SW 1001.02) shows the large dimensions of ships hauled out of Earl Grey Dock on a cradle. The width of paddle steamers had made existing dry docks useless. The engine was removed in the

early 1960s. An arcaded smiddy operated south of the chimney, to test and repair chains. The Arctic Tannery (NO43SW 1014) processed seal skins to either side of the slip. The main tannery building has been demolished, but the stone squares of the tanning pits were visible until recently. Also converted to housing is the brick-built Panmure Shipyard of Alex. Stephen and Sons/Dundee Shipbuilders Co. (NO 40921 30187, NO43SW 743.01). The nearest slip into the River Tay is that from which RRS *Discovery* was launched in 1901. Art-work in granite records this in the hollow shape of the ship's ribs.

DD7 EAST GRAVING DOCK

NO 41151 30413, NO 43SW 122.00

Built in 1873 and measuring 157.28m (516ft) in length, this dock has a floating caisson dock gate and stepped ashlar sides. Its pump house, containing modern pumps, has a dramatic lean because it stands on made-up ground. The timber storage sheds south of these have been replaced by new apartments. The West Dry Dock depicted in the Telford *Atlas*, is filled in, its site the car park and landscaping to the south of the Apex Hotel, Dock Road.



HISTORIC SHIPS

H M S Unicorn (*Victoria Dock*) was launched at Chatham, Kent, in 1824 and was immediately placed in reserve under a roof rather than fitted with masts. This ensured long-term preservation. Since 1873 she served as a Royal Naval Reserve Drill Ship in Dundee. Relocated for the Tay Road Bridge in 1962, she was handed to the Unicorn Preservation Society in 1968. Iron knees were used in her construction.

The North Carr Light Vessel (*Victoria Dock*) was moored on a shifting sandbank 1932-1974. Built by A & J Inglis, Pointhouse, Glasgow (site of the Riverside Museum: they also made paddle-steamers *Waverley* and *Maid of the Loch*), now owned by the charity *Taymara*. She has no engines for propulsion, and her 250 gross tonnage was towed into position. Three Russel Newbury diesel compressors powered the foghorn.

Reference: Paula Martin *North Carr Lightship: a Maritime Experience*

RRS Discovery (*Discovery Point, DD2*) was launched in Dundee by Dundee Shipbuilders Ltd, (DD6), in 1901 for Captain R F Scott's first Antarctic expedition. Purpose-built for the Royal Geographical Society, the triple-skinned hull was based on Dundee's experience in building whaling ships. Engineed by Gourlay Brothers, (DE10), Dundee Foundry, (scrapped in WWII) and the sails supplied were by Baxter's of Dundee (DE9). She is managed by Dundee Heritage Trust.

DD8 CAMPERDOWN DOCK

NO 41322 30540, NO43SW 90

Completed in 1857-1865 by Charles Ower, Camperdown Dock is almost square in plan. One set, oldest and broadest, of its transit sheds survives at the west side. The East side held Camperdown Shipyard, Gourlay Brothers, 1869-1908, who from 1854-70 had constructed iron ships at Marine Parade. The large drum is a storm chamber (2002). The Dock and its modern gates (the old ones put aside) also gives acces to Victoria Dock and swing bridges span its entrance. A vehicular bridge was at quayside level and the pedestrian bridge is a graceful two-leaf arch turned by hand, bearing the arms of the port of Dundee, 1877. This was repaired as a planning condition of the retail development.

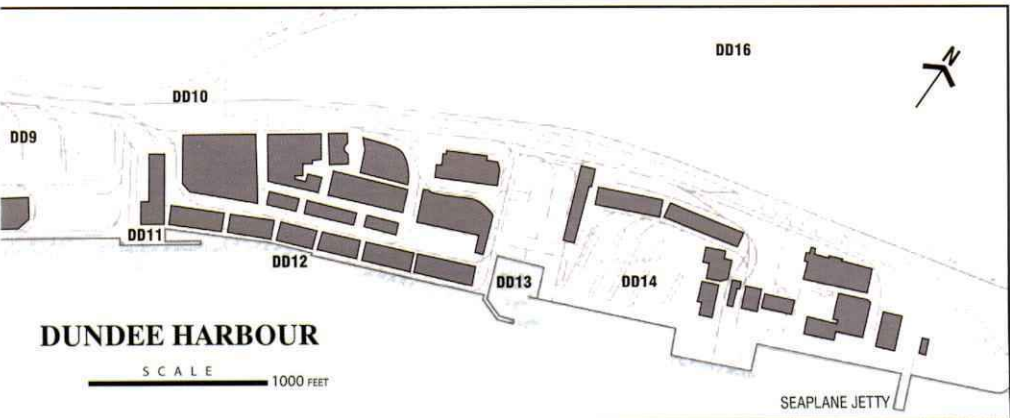
DD9 BRIGGS OIL REFINERY

East Camperdown Street

NO4176 30668, NO43SW 123

Wm. Briggs began making asphalt in Retford, in 1939, moving to Greenock, Arbroath and finally Dundee, where the bitumen business continues. On the north side of East Dock Street, several oil tanks are located behind the lower front wall of Dundee Flour Mills, (rest demolished, East Dock Street / Roodyards Road, NO43SW 573) built 1875/7 for J Forbes White by Cottiers and Co of London. Its fireproof interior by Robertson and Orchar had converted from 14 pairs of stones fully to roller milling by 1887.

*below, Plan of Dundee Harbour in 1952
adapted from a plan in the Dundee City Archives*





DD10: Sewer Ventilator, Dundee

DD10 SEWER VENTILATOR

East Camperdown Street

NO 4196 3075 approx

Viewable from the bridge over the railway, there is a cast-iron sewer ventilator with an open crown top.

DD11 CALEDON BOILER SHOP

Caledon West Wharf. Access is restricted by Port Authority gates to this and the next four sites.

NO 4192 3069, NO43SW 115

Built 1916, this boiler shop occupies the land just east of Camperdown Shipyard, acquired from Gourlay Brothers (who closed in 1908). The Caledon Boiler shop forms a long single bay end-on to the Tay, with its own jetty that had a 17.5 ton Cowans Sheldon crane (now gone). Its sides of brick laid within an overall steel frame, (Franco-German practice) are partly overlaid by sheet metal cladding.

DD11: Caledon Boiler Shop



DD12 EASTERN WHARF

NO 42322 30696, NO43SW 113

The first reinforced concrete structure in the docks, and the first such bridge in Scotland, 1903, carried a railway across a former ship launching slip at Marine Parade, demolished in 1992. Satisfied with its performance in load tests, the Dundee Harbour Board commissioned more reinforced concrete wharves fronting the Tay, all by the Yorkshire Hennebique Contracting Company: Eastern Wharf, 1903-09 is 1,240.79m (790ft) in length; King George V Wharf, 444.7m (1,459 ft) in length, and Western Wharf followed suit to either side of Camperdown Dock entrance. Cranes by Stothert and Pitt, Bath.

DD13 FISH DOCK

Stannergate

NO42556 30759, NO43SW 156

A 0.6070ha (1.5 acre) tidal dock, opened in 1900, was rebuilt with steel shuttering in 1966, by which time the trawler fleet was no more. The c.1930 Carolina Port electric power station stood just to the west.

DD14 CALEDON SHIPYARD

Stannergate Road

NO4279 3097, NO43SW 114

Operated by W B Thompson later known as Caledon, then Robb Caledon, 1874-1981, the yard now repairs North Sea oil rigs, its large steel-framed fabrication shops re-clad in profiled metal sheeting. A bridge over the railway allowed the workforce direct access to the yard. The associated engine works was originally Tay Foundry, Mains Loan, a considerable distance inland and uphill, requiring marine engines to be hauled by traction engine. The drawing offices, with a domed glass centrepiece, were demolished in the 1990s. See DD11 for the Caledon Boiler shop. East of the yard was the 1918 Stannergate Seaplane base (hangars demolished) and the Tay (later Caledonian) Oilcake Works - the brick buildings

off the Broughty Ferry Road roundabout (NO 4341 3100, NO43SW 725), now partly occupied by a pet food supplier.

DD15 DUNDEE GASWORKS

North side of East Dock Street

NO 41260 30760, NO43SW 136

The gasworks took made-up ground between what was the shore and the escarpment that carries Broughty Ferry Road. This land was taken by some of the more noxious industries, and remains are fragmentary, e.g. the abattoir, which once sported carved animals. The main gasworks has been cleared of most structures except one large postwar spiral-guided gas holder and some brick buildings with arched windows. Two more gas-holders were adjacent to Dundee Foundry (bounded by East Dock Street/Peep O' Day Lane), and two small ones in the early-mid 19th century were between Verdant Works (West Henderson Wynd) and West Ward Works (Blinshall Street), superseded after gas supply was taken over by the municipality in 1868.

DD16 CRAIGIE HOUSING

A superior tenement on 82-84 Broughty Ferry Road / St Matthews Lane was built for key work-



DD16: Craigie houses made of steel plate in Caledon Yard, 1920-1925

ers of Gourlay Brothers' Shipyard (architect C & L Ower, 1890; NO 41414 30908, NO43SW 494). Nearby at South Baffin Street an enfilade of tenements (NO 4146 3093) concludes in an impressive bulwark of steps, railings and (until stolen) a plaque to Mary Shelley (NO 41461 30964). The Craigie housing scheme (NO 42902 31355), second after Logie, is laid out as a radial garden suburb, Craigiepark Church as a focal point. Half of the houses were built in Caledon shipyard of steel plate, rivets showing through layers of paint and render.



Victoria Dock in 2010, looking toward the land reclaimed in the 1830s to define the south quay or Marine Parade. The Dock was not completed on the landward side until 1873.

from left: Panmure Shipyard, later WR Stewart's hackle works; Harbour Workshops and chimney of patent slip; The Nicol & Jack blacksmiths shop was built c.1970 and as lesser significance was accorded it in the conservation plan, was replaced in a contemporary manner as part of the development of apartments in converted buildings, and rising higher as two blocks to either side of the patent slip. The North Carr Light Vessel and a pilot boat are moored in the dock.

The weaving district of Hilltown and the tenements of Stobswell enjoy the south-facing slopes of the Law. The evidence for handloom shops is noted at DE4 and DE12-14 From Coldsides, north of the Law, the Dens Burn makes its course to the sea in a culvert, and supported a string of spinning mills and engineering works, supplemented by much needed mains water from 1848.

DE1 LAWSIDE WORKS AND DYEWORKS

Milton St / Paterson Street/West Street

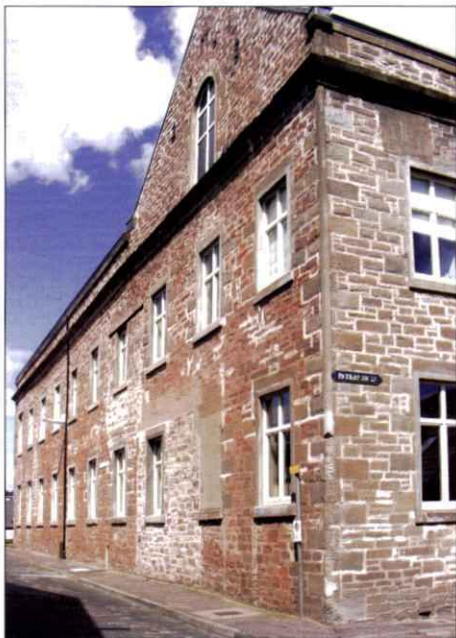
Lawside Works is an L-plan, 2-storey and attic spinning mill (NO 39601 31755, NO33SE 88), built in the 1830s and 1860s. In 1888 a new carpet weaving factory was added to the east, with a 2-storey front, long weaving shed behind and an engine house with a little Italianate clock and bellcote (NO 39633 31783). This is now converted to housing. Across the road, Lawside Dyeworks (Milton Street/West Street; NO 39537 31676), 1861/1895, has two circular-section chimneys, one broached from a square base, the other adapted to support a concrete water tank. It is of several phases and has an oriel window at its boardroom. There is single-storey and attic workers tenement housing nearby in West Street.

DE2 BOWBRIDGE (GRIMOND'S), ANGUS AND DENSFIELD WORKS

Dens Road / Thistle Street

NO 40110 31580, NO43SW 81.00

Founded in 1856, this vertically-integrated jute factory is now missing its 5-storey neo-classical mill that fronted Dens Road and extensive weav-

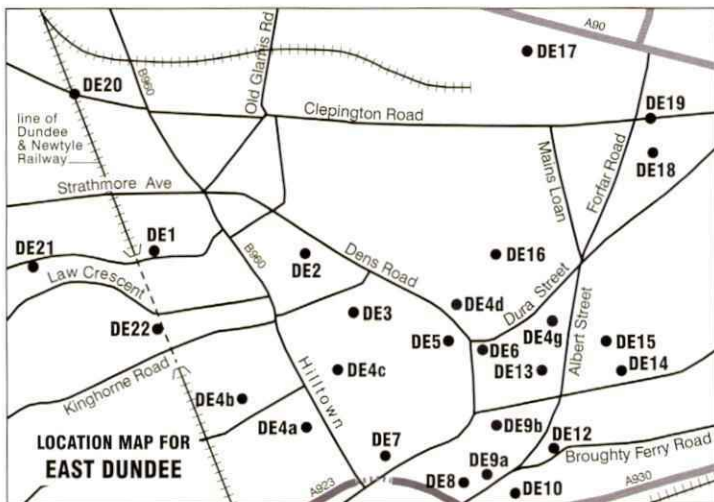


DE1: Lawside Works: spinning mill.



DE2: Bowbridge Works in 1927 and beyond Dens Road Primary School, Densfield and Angus Works, an electric substation and the grounds of Dundee and Dundee United F C.

© Crown copyright RCAHMS



ing sheds. Brick and stone-built jute warehouses survive from 1883-5. A gate with a metal panel shows a camel, reminder of the carved camel that once sat over the entrance arch until lorries got too big. Just to the north, beside football grounds Dens and Tannadice Parks, is Densfield Engineering Works of TC Keay (Tannadice Street, NO 4025 3177, NO43SW 97), which manufactured textile weaving and finishing machinery, with a good example of a brutalist office (now Radio Tay) and new machine shop added in 1970. A horizontal engine house and warehouses of Clepington Jute Works (1874), preceded use as an engineering works. Angus Jute Works (1879, Fairburn Street, NO 40360 31700, NO43SW 98) has 2-storey fronts to north-lit sheds, subdivided for various businesses. Both were built by Thomson Brothers, Douglas Foundry, Dundee. Brick buildings west of this are a transformer station and at Arklay Street, (NO 40580 31580, NO43SW 83) the jute warehouses of Clepington Waste Works.



DE3 CALDRUM WORKS (WALKER'S)

St Salvador St/ Main St

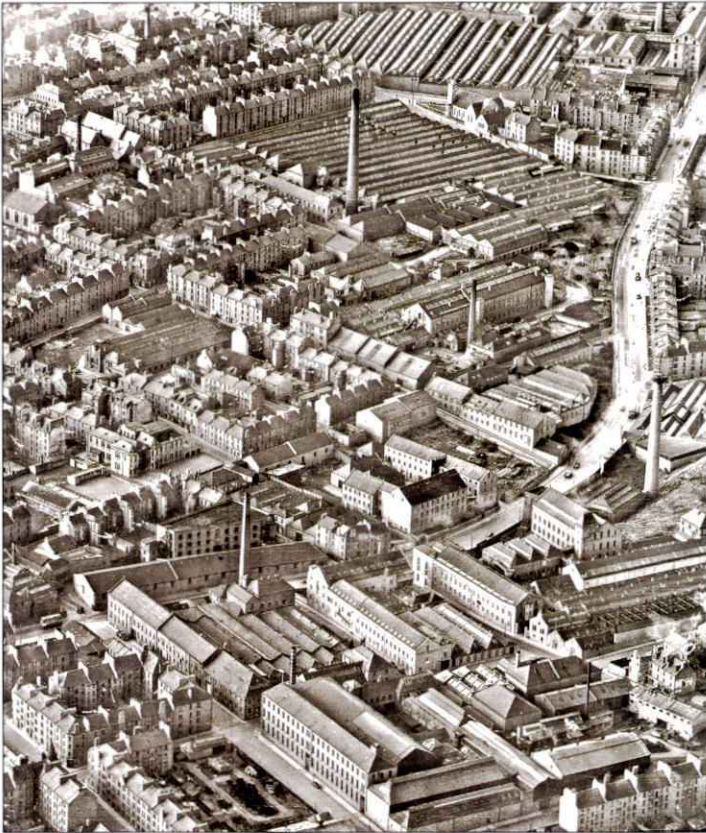
NO 40276 31441, NO43SW 99

Built 1872, by Robertson & Orchar, this is the perfect first working-out of the single-storey integrated jute mill, with east-lit mill roofs of varying span for spinning, and a regular span for weaving. Jute travelled under one roof in a direct line east to west through the various processes and emerged as finished cloth. Beside the original horizontal engine is a vertical engine house, 1905, and in front of it a boardroom was added over the gates. The mill now extrudes polypropylene yarn for Astroturf, carpets etc. as Bonar Yarns Ltd.

DE4 HILLTOWN WEAVING

Hilltown was the manufacturing suburb to medieval Dundee, known for its blue bonnets, firearms and buckles. Hand loom weaving took place domestically and in factories, and some of these expanded to adopt power looms. Surviving buildings are: Hillside Works, Hilltown (NO NO 40112 30916, NO43SW 690), its brick front office built in 1910; Dundee Linen Works, 31 Constitution Street (NO 3985631054, NO33SE 82), its office and factory front wall (1873 broadloom carpets woven by hand) converted to flats; Grimonds' Maxwelltown Works, James Street, 1848, (NO 40180 31180, NO43SW 102, now Delta Capillary Products) consists of a weaving shed with a chimney and at South George Street the blocked windows of the hand loom factory, formerly three storeys; Rashiehell Works, Dens Road (NO 40619 31456, NO43SW 190) built in 1855 as a power loom weaving fac-

left: DE3: Caldrum Works, Boardroom



DE3, 5 and 6 in 1958; from the top: DE2 Bowbridge (part); DE3 Caldram Works (shed with chimney); Hillbank Mill (served several buildings, only DE5 extant), and on the right side of Dens Road, DE4 Rashiewell Works, and DE6 Dura Works, the latter surrounded by the now demolished Constable and Wallace Works, Wallace Foundry and Whitehall Waste Works (Dens Road Factory). Jamaica and Ann Street Works, demolished, are also shown on the left of Caldram and Hillbank Works respectively. All are jute mills apart from the foundry in the foreground where Robertson & Orchar made looms and other jute machinery.

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tory but after the merger into Jute Industries was reassigned to winding. Now Dens Road Market, the rather hotch-potch buildings allow one to see a factory interior. Its tall circular-section chimney is one of few left; Buchanan Works, a little to the East, (Buchanan Street, NO 40840 31370, NO43SW

495) processed jute waste; James Park Factory, Albert Street, is where innovative textile design company Donald Brothers started. It has louvred windows at its warping lofts, now unique.



DE5: Hillbank or Blaikie's Mill

DE5 HILLBANK / BLAIKIE'S MILL

Alexander Street / Dens Road
NO 40663 31318, NO43SW 92

This 3-storey, red sandstone flax mill of 1834 is narrower than usual. Its fireproof floors are formed from tiles rather than brick. Two other mills formed a courtyard, but were demolished for new housing as part of the conversion of this one in 1986. Made one million sandbags per week in WWI.

DE6 DURA WORKS (SCOTT'S)

Dura Street / Cowan Street/ Dens Road.
NO 40756 31253, NO43SW 94

Beside Dens Burn, which runs in a stone lined culvert down the East side of Dens Road, this 3-storey L-plan fireproof flax spinning mill was built in 1836 for Harry Walker, flax spinner from Dura Den in Fife, F20. It has a tripartite windowed engine house with spiral stair and arched openings for the boilers. Walls are part carried on cast iron columns inserted to open out access to carding machines, with the bearing pads for line shafting. Converted to housing in 2002. (See DE3 for Walker's new mill, 1874, after which Dura Mill passed to James Scott of Mid Wynd and Hillbank Works).

DE7 VICTORIA ROAD CALENDER (A&S HENRY'S)

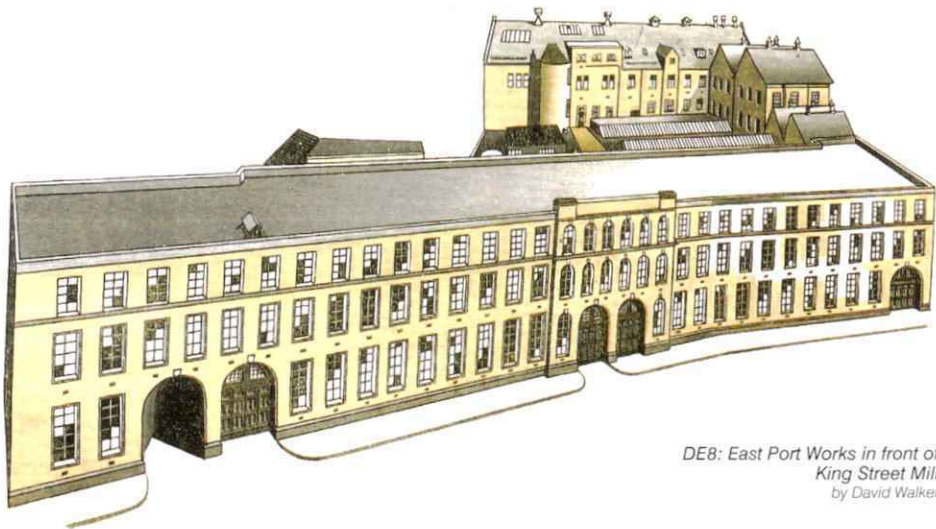
60 Victoria Road
NO 40385 30799, NO43SW 165

Built in 1874 and designed in the Scots Baronial style to fit into an Improvement Act street by engineers Robertson & Orchar, the tall ground floor was for press packing and dispatching. The



DD6: Dura Works

calenders and mangles extended from the first floor into the hillside behind. The second floor was fitted out by merchants A & S Henry as the counting house for a business that included several mills in India. Acquired for use as the Industrial Museum for Dundee, a change of mind led to the evacuation of most of the museum items, and its conversion to housing, during which a fire necessitated careful restoration of the upper



DE8: East Port Works in front of
King Street Mill
by David Walker



DE9: Eagle Mill. This pattern of Gothic-traceried cast iron roof, made in Baxter's Foundry is present in all four spinning mills in Dens Works and at Verdant Works, DW18.

part of the building. Forebank Dyeworks (Francis Stevenson, from 1895 Wm Watson's, 88 Victoria Road, NO 40458 30837, NO43SW 164), two blocks to the east, also forms part of the Improvement Act Street. The 4-storey front building was converted to housing in 1985.

Art student David Walker and future Chief Inspector of Historic Buildings in Historic Scotland was seen sketching Dens Works, c.1950. Invited in, he was offered all the artist's canvas he needed in return for drawings of each Low & Bonar factory, for a company publication.

DE8 EAST PORT WORKS

Cowgate / King Street

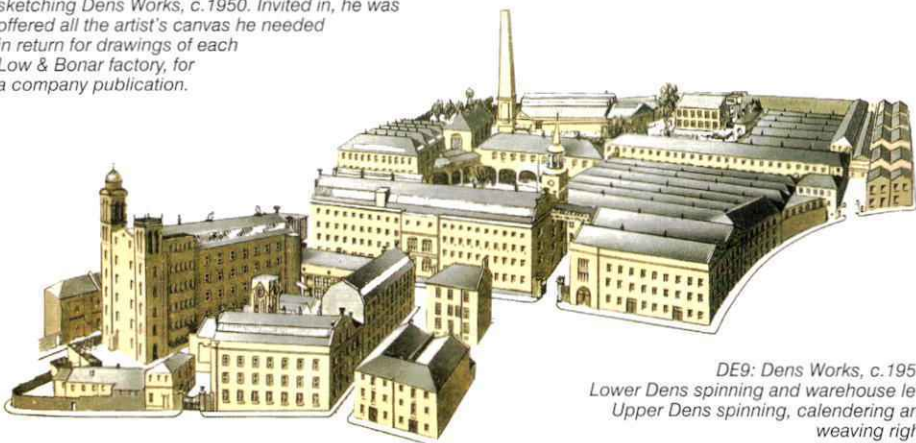
NO 40671 30735, NO43SW 86

This 1913 cloth finishing works closed in 1992. Note the high ground floor for calenders, mangles and press packers, and arched openings complementing the 16th century Wishart arch. New housing was built behind the facade in 1997-8. This links to the 4-storey King Street Mill of 1837, fireproof, and built just as the recession took hold so not put into operation at that time. The same form of construction as Old Mill at Tay Works (DW23), with vertical shrink rings, but circular stone pillars at the ground floor warehouse. There are substantial cooling ponds in the basement, and reputedly, a boat. At first floor level the sewing flat of East Port Works extended as far as King Street. The two upper floors served as offices for Low & Bonar, the frontage remodeled in 1912 and a marble-lined staircase.

DE9 DENS WORKS (BAXTER'S)

Princes Street splits site into Upper and Lower Dens

Founded in 1822 by Baxter Bros, world's largest linen sailcloth and canvas manufacturers. Closed in 1978, Upper Dens Works (NO 40777 30847, NO43SW 104) was developed by Hillcrest Housing Association in 1983-5. A spired fireproof spinning mill, engineered by Umpherston and Kerr in 1833, and doubled by Randolph and Elder (Glasgow) in 1850, has a double engine house fronted by tripartite windows. The weaving shed, 1836, was on the terrace above a stone gothic arch. North of Victoria St, on a triple-arched bridge over Dens



DE9: Dens Works, c.1951. Lower Dens spinning and warehouse left; Upper Dens spinning, calendering and weaving right. by David Walker



DE10: Dundee Foundry in 1995: engine erecting shop

Burn, the works foundry of 1864 was extended as Eagle Jute Mills (Victoria Street, NO 31045, NO43SW 85) in 1930. Lower Dens Works (NO 40797 30803, NO43SW 1050) has spinning mills of 1830s/1889, 1865, 1866 (with a bell tower modelled on S. Maria della Salute, Venice) and 1935, each designed by, and built with castings made in, the works. Each 19th century spinning mill, and the foundry, has a gothic mansard cast iron roof. Tunnels under public streets link the mills to raw flax warehouses, a pair dated 1828 in a gearwheel, Constable and Dens Streets. Three chimneys took the form of obelisks and the gates to the works had Egyptian-style columns: the extant pair on Crescent Street were for the half time school, 1858. On Arbroath Rd is Baxter Park (NO 41440 31620, NO43SW 486), laid out by Joseph Paxton and a gift to Dundee by Sir David Baxter, 1863. see AN12; DE13

DE10 DUNDEE FOUNDRY

40 East Dock Street. Accessible as Marks and Spencer

NO 40867 30602, NO43SW 513

Established in 1791, Dundee Foundry was known (under James Stirling) for the air engine, patented by Rev R Stirling in 1827, and for locomotives 1834-48, with apprentices going on to manage GWR and GNR Works. From 1843 its owners, Gourlay Brothers, concentrated on marine en-



DE12: Wallace Craigie Works, the oval oculus window in the gable end inspired by Dundee Town House

gineering, building ships, from 1854 at Marine Parade and from 1870 at Camperdown Shipyard, and engined RRS *Discovery* and SS *Robin*. The firm closed in 1908. The principal surviving building is the marine engine works of 1871, cast-iron framed on I-section stanchions. The narrower span housed two floors for machining on hefty Hodgkinson beams, and the wider span was a full-height space for assembly of inverted vertical engines. This erecting shop was dismantled in 2001-4, rotated through 180 degrees and its iron frame and timber king post roofs re-erected within new walls for what is now Marks and Spencer. The roofs can be appreciated from the cafe and an electric travelling crane by Babcock and Wilcox of Renfrew is well displayed.

The Dundee and Tay Whale Fishing Companies were just to the west, where the swimming pool now is (around NO 4080 3064) able, aptly, to haul a whale ashore. This area has been land-locked since 1833.

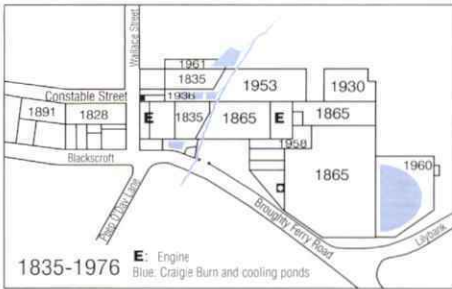
(NB: Site DE11 omitted)

DE12 WALLACE CRAIGIE WORKS (WILLIAM HALLEY'S)

Broughty Ferry Road/Wallace Street

NO41080 30881, NO43SW 100

Built 1836-7, this 4-storey, 6-bay fireproof spinning mill had its engine house lit by the larger window in its West gable. It was lengthened in 1865 by Pearce Bros engineers, with a double-arched window to a new engine house, and weaving factory alongside with a multi-storey warping/winding department. This, the last family-owned textile factory in the city closed in 2004 and awaits conversion to flats. Note the small blocked windows in Halley's adjacent handloom factory (1828) and warehouse in Constable Street.



Evolution of Wallace Craigie Works
 Ref: J.R.L Halley *A History of Halley's Mill* 1981

DE13 CRAIGIE BREWERY AND NEARBY HOUSING

2-4 Lyon Street

1872, 2-storey and basement brewery. Its cooler was on the first floor. The formerly louvered malt barn was at right angles to the street. The kiln has been removed but there are two vaulted bays inside what is now a furniture shop. Brewing ceased c.1920, but bottling continued to the 1960s. Blocked window openings in the building to the west (10-14 Lyon Street, NO 41035 3125, NO43SW 1060), now Abertay University, indicates former use as a handloom bagging factory, which had ended by 1872. The tenements opposite were built in 1860 by Baxter Brothers as a rare attempt to provide company housing in the city, but soon the occupants were no longer tied to Baxter's.

DE14 TAYBANK WORKS / LILYBANK FOUNDRY / FACTORY

62 Arbroath Road, Kemback and Morgan Streets
 NO 4134431175, NO43SW 96

This site grew from jute weaving (in 1849, retained outer wall of power loom shed) to spinning (1873) under A J Brough, and was in the 20th century owned by SCWS. A small 3-storey spinning mill of 1873 by Pearce Bros has mansard gothic

cast iron roof trusses and a projecting engine house. The unfinished gable, waiting for the next economic upturn, gave an opportunity to add a new stair and balconies when it was converted to flats in 2000. A bigger spinning mill was built in 1949, faience-clad with portholes and a corner entrance lobby, fronting new housing completed in 2008 (corner Arbroath Road/Morgan Street). This was the last UK jute spinning mill to close, in 1999. That mill is on the site of Lilybank Foundry, parts of which survive in Kemback Street (NO 41227 31157). Established in 1843, it was used by Pearce Brothers 1866-1889 who engineered mills in India as well as in Scotland, and made land and marine steam engines, succeeded there by W B Thompson, Caledon Shipyard. The office/ pattern store, Kemback Street, had an extra storey added with steel arched roof trusses, now heightened again. A small park between Raglan Street and Arbroath Road (by bus stop, NO 41130 31143) has a retained wall with the characteristic handloom shop windows, 70cm x 90cm (28"x36"), that lit Lilybank Handloom Factory. It operated c.1820-c.1870, and was advertised for sale in 1827 and 1850. Stark & Geddes had loom shops, drying lofts, boiling and dwelling houses at Arbroath Road. It shared the name Lilybank with the power loom factory until the latter switched name to Taybank in the 1860s.

DE15 WELLFIELD WORKS

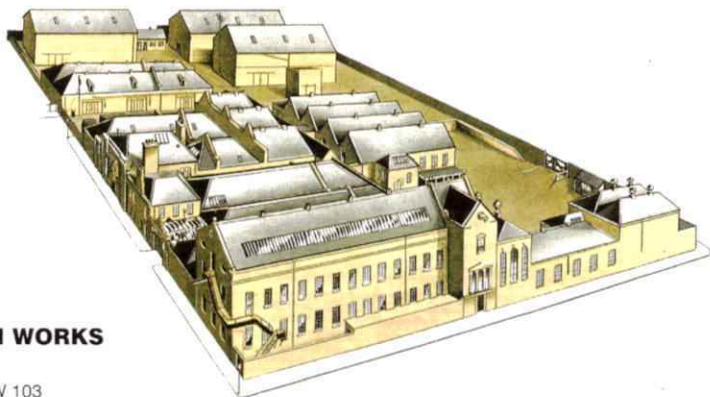
Kemback Street/Craigie Street
 NO 41234 31313, NO43SW 233

Jute mill built for Henry Boase, 1866, by Pearce Brothers engineers. Beside the 3-storey mill, with its original beam engine house to Craigie Street, there is a very tall engine house which was added in 1906 for a vertical marine engine and rope drives lit by tall arched windows. A substantial boardroom oriel was added in 1913. From 1955 it has made plastic packaging for the food industry, now owned by Discovery Flexibles.



DE14: Arbroath Road, Taybank Works weaving shed

*right, DE16: Manhattan Works
 far right, DE18, Maryfield Tram Depot*



DE15: Wellfield Works
by David Walker

DE16 MANHATTAN WORKS

Dundonald Street

NO 40850 31620, NO43SW 103

This single-storey vertically-integrated jute spinning and weaving works was built in 1873-4 by Thomson Bros for Col. Frank Sandeman, also of Stanley cotton mills. The engine house, with ornate timber trusses for the first Corliss engine in Dundee, was extended to the front when re-equipped in 1914, with a travelling crane, and in the 1950s dynamos were installed. The frontage was completed in the early 20th century. Spinning stopped in 1995. It is now occupied by several small businesses.

DE17 KEILLER FACTORY

Mains Loan

NO 40950 32370, NO43SW 135

The confectioner and preserves maker had its main factory at what is now the Forum Centre in the heart of Dundee, but in 1930 moved part, and later all, of its production to a wedge of land on Mains Loan. There is a stepped art deco treatment to some of the buildings, occupied since 1992 by various small businesses.

DE18 MARYFIELD TRAM DEPOT

25 Forfar Road

NO 41432 32009, NO43SW 778

This the only remaining of the City tram depots is a long, brick-built building with twin gabled entrances to Forfar Road. It opened in March 1901. Six tracks held 30 tram cars. Trams stopped running in 1956. Tram tracks are still set into the forecourt.



Ref: Alan Brotchie, *Tramways of the Tay Valley* (1965)

DE19 STOBSMUIR WATERWORKS

Cleington Road

NO 41467 32093, NO43SW 788

By James Leslie, 1845, with castellated outer walls to toy fort Valve House and Chart Room. This was covered as a concrete-roofed reservoir (Truscon system) in 1908. Boating and recreation ponds are adjacent.

DE20 A turreted Sluice Chamber at 371 Cleington Road, 1874, with valves by Glenfield & Co, Kilmarnock, by J & A Leslie with Frederick LaTrobe Bateman, regulated and reduced the flow in three pipes from Monikie into Stobsmuir. This proved necessary as high water pressures in a scheme implemented by James Stewart had burst pipes, just as Leslie and Bateman had predicted.

DE21 Lawton Reservoir, 96 Byron Street, M-roofed timber trusses on cast iron columns, also by Leslie in 1874, distributes water into Lochee and western Dundee, supplemented by an addition of 1911 below a turf and concrete roof. This feeds into **DE22** a tower disguised as a doocot on the other side of Law Hill, built in 1922 for the Stirling Avenue District Heating Scheme on those slopes.



The area north of Dundee and bounded by the Sidlaw Hills was mostly within Dundee District Council until the last local government reorganisation. Now it is split between Dundee City and Angus. An account of the industrial archaeology of the area follows linear logic rather than council boundaries. First it follows the route of the Dundee and Newtyle Railway and then the route of the Dighty Burn, one of the busiest streams in Scotland. Then the various elements of the 19th century public water supply to Dundee are encountered in a landscape of farming and quarries, and finally we take the route of the Dundee and Arbroath Railway as it skirts the coast from Broughty Ferry, fishing village turned Millionaire's Row, into Arbroath.

DG1 BENVIE MILL, DUNDEE

NO 32809 31493

A 19th Century corn mill that is an enigma. There is no immediate sign of the water that powered it, because it arrived in a tunnel just below the road surface, and was then carried away in a long culverted tailrace, beautifully constructed of tight jointed ashlar. The mill contains a breastshot cast iron wheel with timber spokes and buckets, grain cleaning machinery and two pairs of grinding stones, elevator and White's weighing scales. This is complimented by a kiln at one end with revolving vane (wire mesh floor) and adjoining that the miller's house, 1865, sympathetically extended to the rear, where was the pigsty. Still a private house with mill attached.

The lade was also used to power the threshing mill in the nearby Benvie farm in Angus. That all-timber wheel is set deep into a wheelpit below the threshing mill. Other mills in that watershed have lost their machinery long ago and some are now converted to houses, like Fowlis Mill. Further upstream the same water course was used to

generate electricity for Balruddery House by a Boving Turbine, 1926.

DG2 NEWTYLE RAILWAY STATION,

Newtyle, Angus 10 miles NNW of Dundee on B954
NO 29964 41364, NO24SE 62

The Dundee and Newtyle Railway opened in 1831. At Newtyle there remains a large rubble masonry train shed with elliptical arched entrances at each end. The date of this is uncertain but it may be the second station on the site, built shortly after the line was leased by the Dundee and Perth Railway in 1846. The grid-planned new town of Newtyle was expected to develop thanks to the railway but the main industry was a bone mill that ground bones conveyed from Dundee for use as fertiliser. Its bell tower makes a little memento at Knox Close.

Ref: Niall Fergusson, *The Dundee & Newtyle Railway* (1995)

DG3 ALYTH JUNCTION

Beside the Belmont Arms, Angus
NO 29356 42983 NO24SE 77.01

Newtyle and Glammiss Railway (sic) continued the route into Strathmore in 1837, west to Coupar Angus and east to Glamis. This last closed in



left, DG1: Benvie Mill
above, DF2: Newtyle Station

DUNDEE AND NEWTYLE RAILWAY

NO3788 3491 NO33SE 111

DUNDEE AND NEWTYLE RAILWAY was planned in 1825, before the opening of the Stockton and Darlington Railway, opened in 1831 and is the first public railway in Scotland not associated with coal mining. It ran North East of Dundee and was intended to head off the threat that trade in Strathmore would go to the coast at Arbroath rather than Dundee. Its 11 1/2 mile route, planned by Charles Landale, headed straight up three hills, following a visit to observe practice in Tyneside. Two stationary engines at Balbeuchly and Hatton were by J&C Carmichael, and the Law incline was hauled by a Maudsley engine. Initially the trains were horse-drawn between these, beginning at a tunnel cut through the law in 1829 (now sealed at both ends). The first locomotives took their place in 1833/4 (by Ward and Dundee Foundries, DW22, DE10). In 1837 links were made to Glamis, Coupar Angus and Dundee Docks via streets. In the 1860s the inclines were by-passed, allowing locomotive haulage throughout a series of circuitous loops.

The line closed to passengers in 1955, but some stretches may be walked or cycled, (avoiding the tank driving range north of Auchterhouse) There are two small bridges west of Eastfield Farm (NO 345 375, blocked and repaired, 2001. Park and walk from Dronley Wood or from Auchterhouse) and one crossing the Dighty (NO 353 363) to the west of the 1860 bridge, which carries the walkway. Some footings exist at the top of the Balbeuchly Incline (private farmland). There is a stretch of retaining wall near Baldragon (NO3788 3491 NO33SE 111) with some stone sleeper blocks.

In Dundee there is a wayside halt within the grounds of Kings Cross Hospital, 276 Clepington Road (NO 39219 32239), east of and opposite DE20, and also Lochee station, DW3. The route of the incline is evident at the Drummond Place boulevard, the eastern edge of Dundee Royal Infirmary, Parker Street (tenements built on site of the ramp) west side of the wall to Constitution Rd Cemetery (multi storey car park) to Ward Rd station, now BT offices.

Ref: information from Tony Jarvis and Elliottsimpson.com/historyofme/DNR01a.html

1846-7 as a route a few yards to the north was taken by the Perth-Forfar route of the Scottish Midland Junction Railway in 1848. The result is an interesting variety of embankments, loops and viaducts between Newtyle and Meigle, some of which may be walked or cycled. An elliptical arched overbridge, railway workers cottages with wallhead dormers, the stone circle of a turntable and the post of a crane are amongst the railway ephemera that may be spotted. A new station

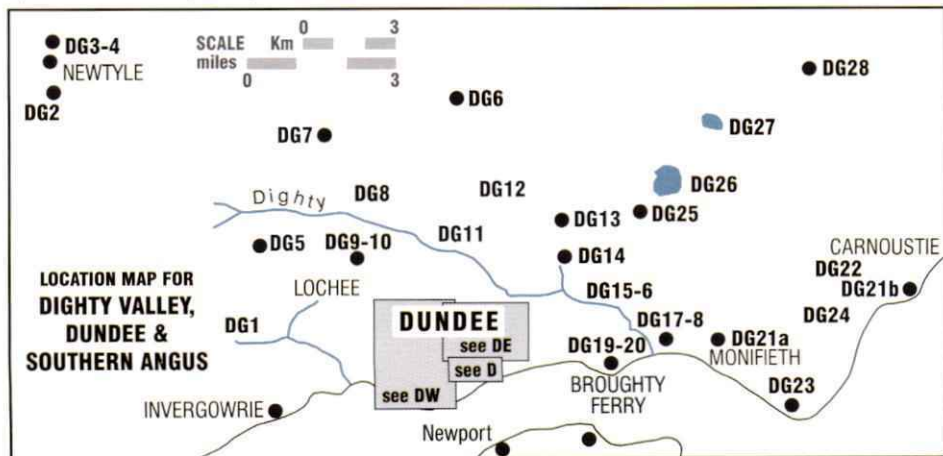
building, thought to be 1861 (but could well be 1848?) with an oriel window, closed in 1951.

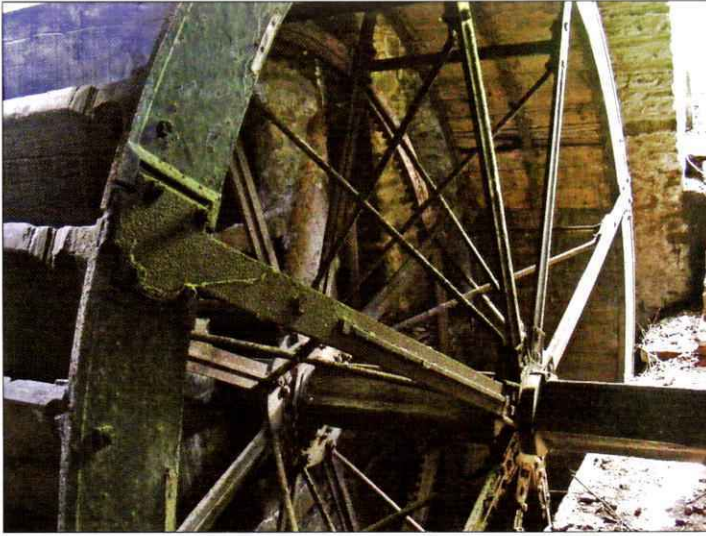
DG4 NETHERMILL, ALYTH JUNCTION

Beside the Belmont Arms, Angus

NO29440 43025 NO24SE 75

L-plan grain and threshing mill, sympathetically converted to a house while retaining machinery. Overshot external water wheel with timber buckets and spokes, iron axle and rings 4'6" by 17'6"





DG7: Iron water wheel for a farm threshing mill

diameter (1.37m by 5.18m) is under a lean-to roof. Pliended (half-hipped) roof with kiln vent.

Ref: Hume 1977 p143

DG5 CLATTO RESERVOIR

Clatto Country Park, Dundee

NO36998 34497 NO33SE 557

J & A Leslie, 1874, Square in plan, earthen embankments with a puddled core and a circular masonry sluice house. It served as a staging point for water brought from the Loch of Lintrathen. It opened as a country park in 1979. Note that there is another Clatto Reservoir in central Fife.

DG6 TEALING DOOCOT (HISTORIC SCOTLAND)

Angus,

NO 41283 38134

Dated 1595 with crowsteps and a monogram "DMHG". It has a double pitched roof, usual in most buildings but unusual for a dovecote, and the nest boxes are formed from local split sandstone ledges. It is within a range of farm buildings on the 18th/ 19th centuries, and an iron age Souterrain may also be visited.

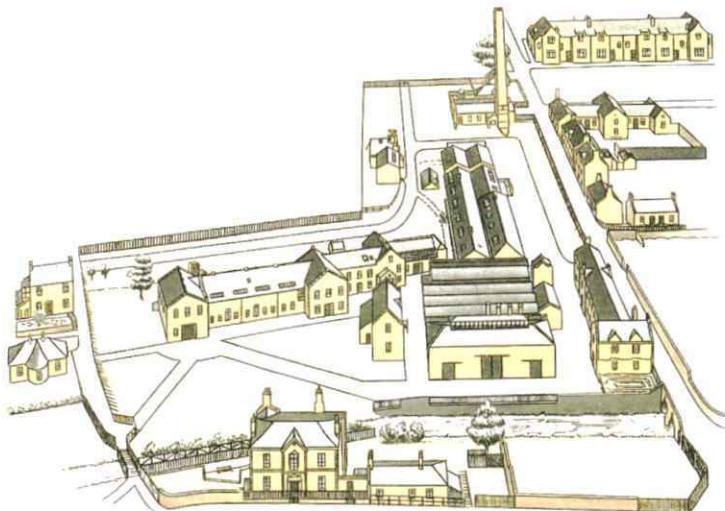
Tealing Doocot is in the care of Historic Scotland.

Doocot is Scots for dovecote, and doos are pigeons, a convenient source of meat. The projecting ledge is a rat course to stop rats from raiding the pigeon nests. The double-pitched roof has a stone ridge and the gables show typical Scots details influenced by the low countries: crow steps coming to an end at skewputts that project from the wallhead. The door is studded with nails.

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Historic Scotland.*



DG10: Claverhouse Bleachworks, c.1950. Company housing around a water driven beetling mill, School and Counting House are bottom right drawing by David Walker



DG7 SOUTH BALLUDERON FARM

Angus

NO 38554 38078 NO33NE 67.03

Improvement-era farm steading of the 1790s. Farming ceased in 1949 so this is something of a timewarp, never having adopted tractors. Its roofs are decaying. An early threshing machine sits above an enclosed 13' (4.3m) diameter high backshot water wheel, 8 cast iron spokes to each side, with suspension rods between, probably the second wheel to be installed here. Power take-up was by gearing at $\frac{3}{4}$ diameter to the threshing machine directly above. Private.

DG8 DIGHTY MILLS

Angus / Dundee

NO 36060 35598 to NO 39770 34069

The Dighty Burn gathers waters from Dronley and Lundie Burns (Lundie corn mill is now a house, no machinery) and then achieved sufficient fall to operate a number of mills in succession: Rose Mill,

a bone mill, Craig Mill at Bridgefoot, Balmuirfield plash mill (still with a timber and iron waterwheel. B&B residents have a chance to see it). The remains are fragmentary, but are collectively impressive. Then come some bigger units:

DG9 TROTTICK, DUNDEE

NO 40356 33745

Three terraces of mill workers' houses, long and low with roofs and chimneys more important than other details. These served Trottick spinning mill, 1790, where Mr Scott the proprietor played the fiddle while supervising his workforce. This became a plash mill in 1808 for washing yarn, and no longer exists. The housing, associated Mains Church (now converted to housing) and graveyard are a good and early example of a company village so a conservation area goes from Trottick to include DG10.

DG10 CLAVERHOUSE BLEACHWORKS

Claverhouse Road, Dundee

NO 40825 33726

There was a bleachfield at Claverhouse since at least 1792, operated then by Thomas Collier & Co. In 1814, the firm of Turnbull & Co, was founded at Claverhouse by Hector Turnbull with William Baxter and Henry Boase. Most successful and longest lived of the bleachfields on the Dighty, not least because those downstream had to contend with its pollution. The manager lived in the largest house within the complex, and several others were allocated to key positions in the business. A long two-storey range incorporated a school as well as a counting house, with a bell and a

DG9: Trottick mill workers' housing



clock. The other surviving building is a beetling mill. A chimney, reduced in height, still has an impressive stone plinth. This was the bleachworks for Low and Bonar Ltd that included Baxter Brothers, (DE9) so it kept in work until the 1970s, then became a kitchen furniture factory, and then a housing development. The ponds and lades now are managed for their historic and nature conservation interests.

DG11 FINLATHEN AQUEDUCT

Dundee

NO 42054 33060

An aqueduct containing cast iron pipes crosses the Dighty burn, and at one time a mill dam, on nine stone arches, conveying the Monikie water supply to Stobsmuir water works, 1845-8. When first built the pressure of the water as it arrived without scaling back its momentum resulted in burst pipes, so this was rectified by some intermediate regulating points such as at Gagie and Clepington Road. This is probably the largest stone aqueduct for public water supply in Scotland, as Glasgow's 1850s Katrine system used iron troughs.

DG12 GAGIE FILTER BEDS

Angus

NO45539 37216 NO43NE 62

Circular graduation tower by James Leslie, 1848, and three filter beds by George Baxter, 1906. The hump in the field leading to it is Wellbank or Little Gagie Farm Aqueduct, conveying water from Monikie to Dundee.



DG13 AQUEDUCT, BURNSIDE OF DUNTRUNE

Angus

NO43898 34913 NO43SW 151

James Leslie, 1845-8: a seven-arched stone aqueduct to convey Dundee Water Company water from Monikie to Dundee. It spans the millpond formed by a semi-circular dam across the Fithie burn. It serves a saw mill, partly now without a roof. The roadbridge has two arches and a stone milepost, the place names chiseled away to confuse any Nazi paratroopers.

DG14 PITKERRO MILL, DUNDEE

NO 3451 7335

Corn Mill and plash (yarn washing) mill. Several datestones (1590, 1734, 1812 and 1908) attest to a long history, in sasines from 1314, but the mill today is substantially 19th century with an external high breast-shot wheel, cast iron rim, spokes and square axle flanked by a lower mill (one of two plash mills noted in 1734?). The mill was converted to residential use in 1987. The weir is some way to the north on the Fithie Burn. Private property.

DG15 LINLATHEN BRIDGE (WEST)

Dundee

NO 46395 32851 NO43SE 18.03

This 1840-50 cast iron bridge has a cast iron balustraded parapet and 4 ribs each of two castings. The roadway is level and placed so as to meander through the landscape, curving round to achieve access to Linlathen House, so differing in two respects from its predecessor, the East Bridge

DG 16 LINLATHEN BRIDGE (EAST)

Dundee

NGR NO 46039 32702 NO43SE 18.02

Possibly the oldest iron bridge in Scotland, although a precise date is elusive, is believed to date from 1790-1810. It crosses the Dighty burn by means of a steep hump springing from angled



left, DG13: Aqueduct, Burnside of Duntrune
above, DG17: Balmossie Mill

DG16: Linlathen East Bridge after restoration in 2012



abutments. The outer part of the bridge comprises hoops of wrought iron, each diminishing in diameter towards the centre. The smaller hoops are of cast iron. So the overall look is that of the Sunderland Bridge, Rowland Burdon's patent, and there are other versions at Tickford Bridge, Newport Pagnell, and Spanishtown in Jamaica. The sprung trusses under the deck bear some similarity to the work of John Justice. Interlocking strands of wire form the parapets, with some alterations to suit changed roadways and now an inner parapet to do the real job of protecting the user. Access to Linlathen House takes a direct route in a straight line from the lodge, with only a little deviation as the drive climbs up from the bridge.

The bridge had fallen into serious decay, but has been rescued to become an asset for the new residents of the new housing estate, as planning gain required by the City Council, backed by Dundee Civic Trust.

DG17 BALMOSSIE MILL

Dundee

NO 3477 7325

Corn mill with an enclosed high breast water wheel 15' by 5' on 8 T-section spokes. This drove two pairs of burr stones from a spur wheel, and a third

pair of monolithic stones from a flat belt. The mill was widened to take an M roof after 1857. Milling stopped c1920 and the roof had given way before its conversion in 1999. The circular section kiln is contained within a rectangular granary, stepped up from the mill. Note the nearby roadbridge with parapets so low that a new and ornamental iron rail had to be added. Some remains and archaeological footings of Panmure bleachfield are a little way downstream.

DG18 BALMOSSIE VIADUCT

Dundee / Angus

NO 3481 7325

1870, a seven-arched viaduct across the Dighty carried the Forfar and District Railway, and now adopted by Sustrans as a cycle route.

DG19 BROUGHTY FERRY STATION

Gray Street, Dundee

NO 46293 30930, NO43SE 72

The oldest railway passenger station beside a live line? A two-storey booking and parcel office with ornate bargeboards stands beside a timber kingpost awning on nine iron columns with stone plinths: the platform height has risen around these. The shelter is steeper in pitch than at any

DUNDEE AND ARBROATH RAILWAY

Lord Panmure ensured smooth passage as a main promoter and owner of most of the land through which it ran. The route was surveyed by Robert Stevenson in the 1820s and again by Thomas Grainger and John Miller. It opened in 6 October in 1838 from Broughty Ferry to Craigie, and pushed on west to Roodyards in 1839 and finally Dundee at Trades Lane in 1840. There was no prospect of links to Dundee and Newtyle Railway as the harbour blocked routes west, and the 5'6" gauge showed then no concept of a national network. The main rivals were coastal steamers already connecting the two towns. A number of the overbridges are ribbed in the medieval style and the first stations survive at Broughty Ferry (NO 46293 30930) and Monifieth and Carnoustie, to supervise level crossings.

subsequent station. A siding accessed workshops at 261 Brook Street, perpendicular to the line. A timber cabman's shelter of 1907 is north of the track, again used by taxis. The railway, and later the trams, allowed Broughty Ferry to adapt from fishing village to affluent suburb.

In 1999 Railtrack sought to demolish the surface buildings of the station. This was refused and instead the station has been well restored, later accretions that obscured the canopy removed along with a timber footbridge (1877, twisted) and signal box (1887), re-erected in 2012 so as to no longer span the line. Now trains are calling much more frequently than hitherto.

DG20 BROUGHTY FERRY HARBOUR

Dundee

NO 46373 30531, NO43SE 67

A fishing harbour sheltered by the Broughty Castle promontory became part of the east coast rail network when in 1845 a branch railway line connected through Castle Green to the new Ferry Pier by Bouch & Grainger 1847-51. Here balances on a ramp adjusted the track level according to the state of the tide, and trains rolled on to the ferry for Tayport, Fife, until 1887. There was a similar arrangement across the Forth at Granton - Burntisland. The West Pier was formed in 1872 and the Lifeboat House and slip added to the W in 1909 (see F26).

DG21A MONIFIETH and DG21B CARNOUSTIE STATIONS

Angus

NO49675 32266 NO43SE 314 and N05663 3449 NO53SE 13

For the Dundee and Arbroath Railway in 1838, two small single-storey station houses very close to the track, like toll-houses with projecting gables from which to view approaching trains, and then activate the level crossing. A later timber platform building has been transferred from Carnoustie to Bo'ness, Falkirk (SRPS) there to become Birkhill



DG21A: Monifieth Station



DG19: Broughty Ferry Station

station, with ironwork by Beath and Keay of Dundee. Signal box and footbridges.

DG22 BARRY MILL (NTS)

Angus, 2 miles west of Carnoustie on A930/A92
NO 53411 34966

This well-conserved fully working water-powered oatmeal mill dates from the 18th century, rebuilt in 1814, re-equipped in the late 19th century. The semicircular kiln is a distinctive Angus feature. The wheel is 4.6m diameter and 0.96m across, cross-braced with ten spokes per side. It worked commercially until 1982, was bought in 1988, repaired and operated by The National Trust for Scotland since 1992. There are milling demonstrations and a walkway leads along the lade to the mill pond. The old Dundee-Arbroath road passes over a stone arched bridge, bypassed by the turnpike.

DG23 BUDDON NESS LIGHTHOUSES

Angus

**BARRY BUDDON IS A MILITARY FIRING RANGE:
ACCESS RESTRICTED. OBSERVE FLAGS.**

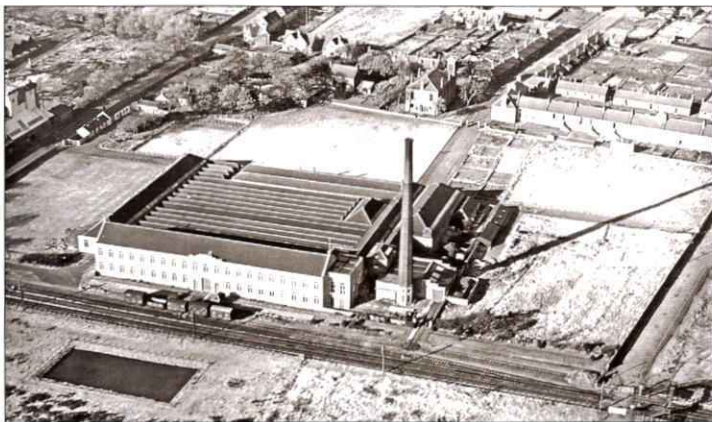
NO 54211 30841, NO53SW 55 NO539310

Lights were first established before 1676. Stone towers by D and T Stevenson, 1825-6, Old High and Low lights are 32m and 20m high. As the sand banks shifted from time to time, so were these lights relocated in 1884 by Dundee Harbour Board rather than let charts go out of date. The lights were discontinued in the 20th century.

aerial view of Panmure Works, Carnoustie, DG24, and its associated company town in 1927.

A linen/jute weaving shed with its beam engine house to the left of the chimney, cooling pond on other side of main east coast railway line. The Panmure Institute with its Italianate tower is just above the chimney

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DG24 PANMURE WORKS, (GRANT'S)

Carnoustie, Angus

NO 55377 34121, NO53SE 10

1857 linen works for Smieton & Co, one of the first linen weaving factories designed, built and equipped by Robertson & Orchar, Wallace Foundry, Dundee. The front two-storey calender shop has a cartouche, to be read from the railway, and a beam engine house. Nearby Panmure Institute, 1864, with an Italianate tower, was funded by the paternalist and music-loving employers.

DG25 DENFIND QUARRY, MONIKIE

Angus

NO 50000 37250

Probably began operating in the mid-19th century, exploiting layers of old red sandstone and siltstone within the Dundee Flagstone Formation. The flaggy stone lends itself to paving. Many other quarries in the local area, including the much bigger Carmyllie Quarry, have exploited the same geological formation to supply significant volumes of building stone in the past. Pitairlie Quarry ceased operations in 1915 but has been recently re-opened by the Denfind Stone company. Operations at the quarry currently consist of stone recycling from spoil heaps, but the owners propose to extract reserves of in-situ stone.

Ref British Geological Survey (OR/11/009)

DG26 MONIKIE RESERVOIR

On B962 signposted and car park, Angus

NO 5025 3800

Engineered in 1845-8 by James Leslie for the Dundee Water Co, this was the principal water resource for the city until supplemented by the loch of Lintrathen. Basins are of 76.9 and 47.4

DG24: Monikie Reservoir, with a sluice valve on right.

acres, and a later one of nearly 20 acres, the water retained by earthen embankments and a puddled core. The first 15" diameter main proved defective so another was needed on the four-mile route to Stobsmuir reservoir in Dundee. Backwater Reservoir allowed the flow from Monikie to come to a stop in 1979 and Monikie is now used for recreation rather than drinking. A sluice valve is on display, between a viewing tower and a single storey building, now a café, and three others are in position in the ponds.



DG27 CROMBIE RESERVOIR

On B962, signposted and car park, Angus
NO 5250 4050

1866-8 supplement by James Leslie to top up Monikie Reservoir and provide compensating water, a more naturalistic shape stopped at the SE by a man-made embankment. This too is now a country park.

DG28 CARMYLLIE PAVEMENT QUARRIES

Angus

NO 5460 4379

In the 18th century small-scale farmers worked sandstone quarries after seed time and stopped just before the harvest. At their peak period, about 1890, the total number of men employed reached 700. The quarries finally closed in 1951.

As the quarries deepened, portable wooden windmills were used to pump water and, around 1830, a culvert was dug at a depth of 40 feet, 180 yards long. In the 1880s windmills had been displaced by eight steam engines, for pumping and planing machines. A chimney survives at Slade farm. In 1854 a mineral railway was opened to transport the stone from quarries to the coast at Elliot, near Arbroath, a distance of five miles.

The 'pavement' rock of Carmyllie is fine-grained and bluish-green. Thick sandstone slabs were shipped from Arbroath to Leith, to London and other English and Scottish towns. Large quantities



DG26: Monikie Reservoir: this in situ sluice regulates levels between the north and south basins.

ready for use as paving were exported to Europe, Australia, North and South America. The stone is found in billiard tables, mangle stones, and cisterns and there was local demand for heavy grey roofing slates. Sandstone from Carmyllie is in the piers and abutments of the Forth Bridge (over 40,000 tons), the University of Glasgow, Perth Station and Cologne Cathedral.

Note: now the evidence lies in great piles of waste spoil where woodland is taking over. Take care near water: quarries can be deep and unfenced.

Ref: Alexander Mackie, The Edinburgh Geologist Issue No 8



AR8-13: Arbroath in 1951 showing Alma Works, AR9, already without chimney, Brothock, AR8 and Burnside Mills with square section chimneys. Lordburn Tannery beyond (now demolished) and other mills and engineering works run up the Brothock water to the left, finishing at AR11, Baltic Works chimney, far left background.

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Aerofilms collection

Arbroath is known for its smokies, haddock smoked in barrels in the "Fit 'o the Toon". Engineering products included lawn mowers, textile and shoe machinery. Linen canvas and sailcloth was the staple industry.

AR1 ARBIRLOT MILL/ MILLHILL MILL

NO 60059 40676

L-plan half hipped corn mill, fast becoming a ruin until converted to a house in 2012 by the Voigt partnership. The rounded kiln is separated from the mill: usually a sign of antiquity, confirmed by a 1719 date, but reconfigured in 1864. Machinery is 19th century: 8-spoke overshot wheel about 3ft wide by 12ft diameter (0.91 by 3.66m) with cast-iron hubs and ring, and wooden spokes,

AR2 KELLY BLEACHFIELD ON ELLIOT WATER

Lochside, off southern roundabout on A92

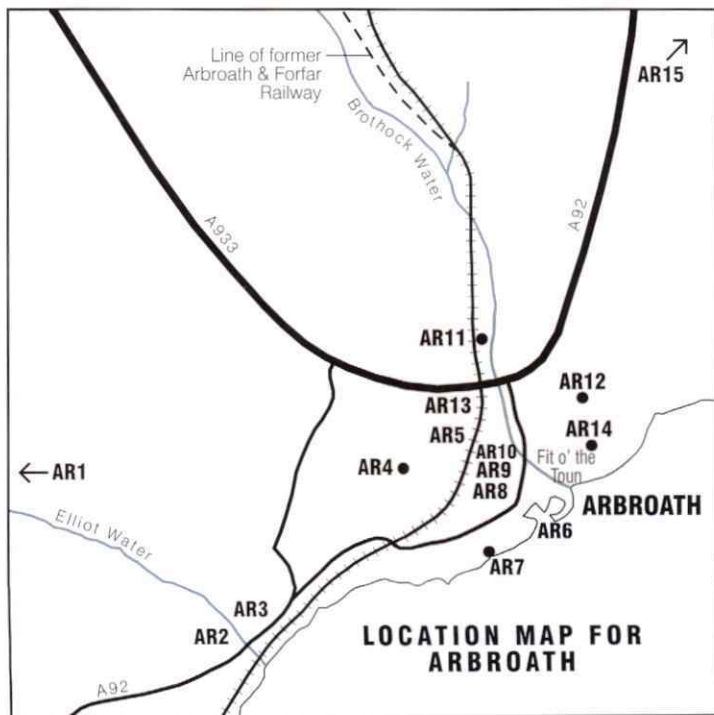
NO6190 3940

Founded c.1800. The owner in 1864 was Charles Dowall, yarn bleacher. A two storey warehouse, an older wall with a tailrace culvert emerging from



AR2: Kelly bleachfield hot house

it and a good example of a wrought-iron curved single-aspect glass house from the first half of the 19th century. It used waste heat from the bleachworks. The rest was demolished in c 2008.





above, AR3: Red Light

AR3 RED LIGHT

A92 on southern approach to the town.

A cast iron minor light, as opposed to a manned major light, gifted from the Northern Lighthouse Board to Arbroath, known for the "Red Lichties". Its service life was in Shetland, and now it stands in a carpark on the landward side of the A92.



AR4: Keptie water tower, Arbroath

AR4 KEPTIE HILL WATER TOWER

Hillside Road, Arbroath

NO 6389 4099, NO64SW 108

Three cast iron water cisterns are in a stone edifice designed by WG Lamond to look like a Spanish castle, 1885, as the trustees of the land demanded something more edifying than the first proposal. It stands in a public park. The water tower held 200,000 gallons pumped from wells. In 1908 it was superseded by a water supply from Glen Ogil but was declared on BBC Radio 4 to be the best-looking in Britain.

AR5 ARBROATH STATION

NO6389 4099

Arbroath station was at first two separate termini, in 1839, for the Arbroath and Forfar and for the Dundee and Arbroath railways. Through-passengers had to walk from one to the other terminus until a deep rock cutting was formed from 1845 by John Miller. The railway platforms were remodelled



AR6: Oblique aerial view of Arbroath harbour and AR7, signal tower, bottom right, patent slip and MacKay's yard top left, 2008

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AR6: Arbroath Patent Slip - the original gearing in 2004

below, AR5: Arbroath Railway Station

Aberdeenshire Council Archaeological Service © ACAS

in 1911 and the early locomotive depot/ goods shed was only recently demolished. A hand crane marks the spot and a signal box stands at the level crossing to the west.

AR6 ARBROATH HARBOUR

NO 6418 4044, NO64SW 28

The harbour, medieval in origin, was improved by John Gibb in 1838-9 and then enlarged by James Leslie in 1841-46 to contain an area of 2.4 hectares within sea-walls of red sandstone. The old harbour of 1725 was converted into a wet dock in 1877 - the wrought iron gates are now kept open. A patent slip by Morton of Leith (the name cast into the rails) uses original gearing, coupled to a motor, in place of the engine cylinder, to haul fishing boats at McKay's boatyard. This and a mass concrete sail loft was repaired through a



Townscape Heritage Initiative. Note also the corrugated iron roofs of the "Black Shed" and of the Lifeboat House (lifeboat station was founded in 1803: slip and building are c1900).



AR7: Signal Tower

AR7 SIGNAL TOWER FOR BELL ROCK LIGHTHOUSE

NO 64051 40447, NO64SW 54

Now an Angus Council Museum (01241 875598). It was built in 1812 by Robert Stevenson to communicate with the Bell Rock lighthouse. Note the cast iron awnings to either side of the courtyard, newly re-roofed in Carnyllie flagstone.

Stevenson and John Rennie completed the Lighthouse in 1811, the world's oldest surviving lighthouse to be built on a rock that is completely under water at every tide. It is constructed of masonry cut to jigsaw shapes and pre-assembled in Arbroath, then erected on the rock with the help of a cast iron railway that still exists on the rock, despite daily inundations. The lighthouse is 12 miles out to sea. "One of the world's greatest civil engineering achievements in the maritime field" (Paxton, 2007). Ref: Paxton

Flax mills and linen sailcloth factories lined the course of the River Brothock, reduced in number from 34 in 1876 to these:

AR8 BROTHOCK MILL/ ARBROATH HERALD

Millgate

NO 6412 4084, NO64SW 118

1806, three storey with arched windows, the tall central one of which fronted a Boulton and Watt engine that was started by James Watt himself walking out on to the walking beam. Columns have curved brackets in the earlier part. c. 1880 fireproof addition to the north has multiple-arched span floors, and a similar external appearance. This was the first steam-powered mill in Arbroath and is the second oldest to survive in Scotland, after East Mill, Dundee. After long use as a printing works for the Arbroath Herald, converted to housing in 2013.

AR9 ALMA WORKS (WEBSTER'S/ WEAVERS' WYND)

Catherine Street and Millgate, across river from Arbroath bus station. NO6403 4091

Francis Webster was established in 1795 and wove sailcloth and tarpaulins, starting bleaching in 1802. A ranch in Texas owned by Sir Francis Webster had, it was reported in 1919, 1000 head of cattle wrapped in his hemp blankets. The firm was until 1992 the last large-scale linen manufacturer in Scotland. Alma Works was built in 1856 for power loom weaving, named after the Crimean War battle. The weaving sheds are demolished. A

AR9: Alma Works, during conversion, the roofs are seen coming off the 1856 weaving shed.



AR8: Brothock Mill

three-storey fireproof building of c.1871 has been converted to flats by Hillcrest HA (47 homes in total, 1997-8). The ground floor was for dyeing. Its column-free second floor is suspended from the timber roof, which has new dormer windows.

AR10 ORCHARD MILL/ NURSERY MILL

West John St, east station platform.

NO6396 4113

Two storey hackle shop for Nursery Mills, 1822-6, with rear stair and blocked locations for extractor fans, showing that hand heckling continued relatively recently. Two storey warehouses of





AR12: Abbot Mill
left, AR11: Baltic Works

Orchard Mill with roof ventilators to north and the base of the chimney of John St Mill is north again. Orchard/ John St split these mills into two, and the larger part of each has been demolished. In Lindsay Street are parts of Bank Mill and in Lordburn Street is the mullioned rear of a warping loft.

AR11 BALTIC WORKS (LOWSON'S / BOND NO 1)

Dens Road

NO 63947 41474, NO64SW 55

1854 neo-classical fireproof front with three pediments, wrought iron roof, a large beam engine house to the rear and a circular chimney. The roof and quoined treatment of the slightly advanced end bays is similar to Edward St Mill and Tay Works (DW16/23) in Dundee, both 1851. This was always for weaving, not spinning, until it became a whisky bond in 1932. It wove yarn spun in Green's Mill

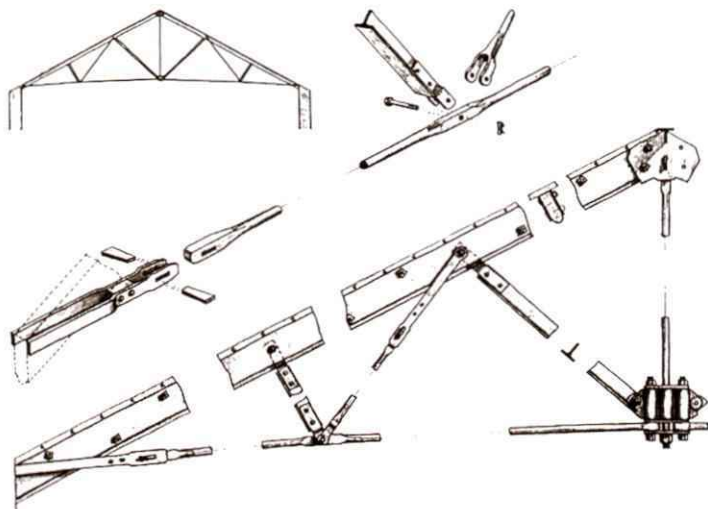
(1837, burned down 1991) on the other side of the Brothock. Both were owned by Andrew Lawson, the biggest manufacturer in the town. Ward Mill Bleachworks adjoin to the north- an open area was studded with posts- and Netherward Works was to the south: parts of both survive. Shank's Dens Ironworks specialised in lawn-mowers, a half-slatted shed north of Baltic Works.

AR12 ABBOT MILL / POWER LOOM WORKS

Abbot St, Ernest St

NO6452 4128

Built 1865 or 1868, had 52 Parker power looms, owned by Smart & Ogg. 5-bay shed and two-storey front. Part of the mill in Abbot St is now Abbey Theatre, with a square chimney at one corner. Close to the town gasworks.



AR11: Baltic Works,
above and right details
of roof trusses, drawn by
Tom Swailes, Manchester
University
© Crown copyright
Historic Scotland



AR13: Wellgate Works

AR13 WESTBURN FOUNDRY AND WESTGATE WORKS

Stobcross, Guthrie Port
NO6394 4128

Douglas Fraser's extensive engineering shops to the east of the railway, crossing the Brothock burn and incorporating Inch Mill, were demolished in the 1990s to be replaced by a supermarket (one of several, the first few of which are also now redundant). A 20th century foundry pattern shop of reinforced concrete stands west of the railway, by a signal box and level crossing. It backs on to

the Wellgate works in which Douglas Fraser began business in linen production in 1832 and where jute plaited alpagartas shoes were first made. These found a niche market in South America. 2-storey stone building, and three flax warehouses in Ogilvie Place.

AR14 GRANT'S SHOE FACTORY / MARINE COURT

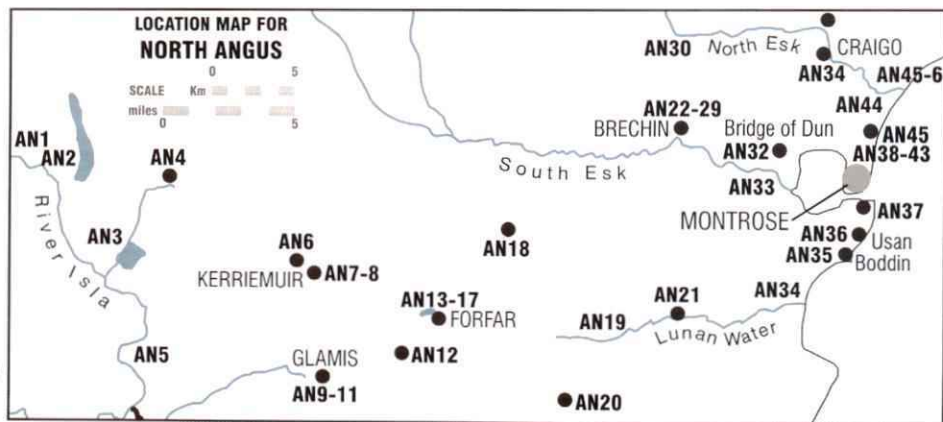
Hill Road
NO6467 4083

Last reminder of the Angus boot industry. Two-storey stone building with turret, portholes and the base of a chimney at the corner. Converted to flats in 2008 after a period as a night club. Murals left by the Polish army of European townscapes were uncovered and recorded during the work in 2008

AR15 AUCHMITHIE

NO6827 4422

Ancient fishing village and point of origin of the Arbroath smokie. Fishing moved from this rocky inlet to the larger harbour at Arbroath, but cottages still are here with a water cistern as centerpiece. Also a rocket house to send rescue lines to boats in distress.



The area set by the map is that north of the Sidlaw Hills and a line from Meigle to Arbroath. Angus is a county with everything: rich rolling farmland, highland glens that give way to drove roads from further north, coastal fishing communities and towns known for linen weaving and associated engineering industries. Farm threshing mills were usually horse- or water-powered with now just one windmill evident and two steam engine stalks- a big circular section one at Cononsyth and a square one at Spitalburn, N of Inverarity. Hume (1977) noted 12 surviving waterwheels in the county. Most of them are still extant and derive from the re-equipping of country flax spinning mills as corn mills in the mid-late C19th.

AN1 KIRKTON OF GLENISLA FOOTBRIDGE

Footpath, the CATERAN trail, runs down from the former primary school, B951

NO2130 6030

1824 Wrought iron footbridge placed, like several such bridges in Scotland, to give access from part of the parish to its church or in this case school, probably with an SPCK grant. This is by John Justice of Dundee, a blacksmith responsible also for the estate bridge at Haughs of Drimmie, Perthshire, which shares some characteristics with it. The treatment below the deck also resembles that at Linlathen bridge, presumed to be built first, and Crathie Bridge, Aberdeenshire, 1834. Each iron pylon is restrained by three anchor stays fixed to the ground and four stays extend to cross each



other across the 62ft (18.85m) span and form part of the parapet. It differs from a true suspension bridge in that it relies on straight diagonal stays rather than a sagging chain.

AN2 BACKWATER RESERVOIR

B951 NO253 591

Opened in 1969, this embankment-type dam was the first to contain chemical grouting. It is 42.6m high by 570m long. Built by Balfour Beatty, with, as consulting engineers, Babbie Shaw and Morton. Note the curving spillway and island syphon house.

AN3 LINRATHEN RESERVOIR

off B951

NO2827 5463

James Leslie, 1871-3. A much larger but more distant catchment for Dundee than Monikie (DG 23). Note attractive interwar fingerpost signs at Bridgend of Linlathen.

AN4 RUTHVEN OLD BRIDGE

NO2894 4889 NO24NE 5

17th century pack horse bridge, two arches bypassed since 1855, now missing parapets and in a dangerous condition.

left, AN1: Footbridge at Kirkton of Glenisla below, AN2: Backwater Reservoir





AN5: Blocked window (on left) in former loom shop

AN5 KIRRIEMUIR HAND LOOM WEAVING SHOPS

The Roods, Glengate and elsewhere around the core of Kirriemuir.

In 1792 there were 516 weavers in the parish, from a total population of 4352. The evidence of loom shops is everywhere in the form of small windows, often blocked in the ground floors of two storey houses. Some of these are 18th century in Crofthead and Kirkwynd. More are from the first half of the 19th century at Glengate and terraces off the Roods, E and W Hillbank. The established pattern is a ground floor loom shop partly sunk into the hillside, to draw light into the small weavers' windows, but prevent loss of humidity that keeps warps from breaking. Each seems big enough for four looms, accessed from a common tenement stair, so unlikely to be purely domestic to the residents. These make large houses nowadays, the tell-tale signs often a number of blocked windows at ground floor.

AN6 J M BARRIE'S BIRTHPLACE

9 Brechin Road, Kirriemuir

NO38714 54045 NO35SE 76,

The only property in the town to have been given the then uniform NTS coating of cement harl is externally rather less informative than the neighbours. These houses are marked "the Tenements" in OS maps, and have 4-loom shops to either side

right, AN8: a typical zinc ventilator over the weaving sheds of both factories.

below, AN7: Gairie Works, Kirriemuir



of the common stair. The warping lofts appear to have been to the south of these, beyond the wash house, and built of timber. Some half-slatted garages nearby may have been connected to these. Open to the public, NTS.

AN7 GAIRIE WORKS (OGILVIE'S)

Bellies Brae, Kirriemuir

NO38602 53795 NO 35SE 61

After successful trials of power loom weaving in the Old Secession Hall, Stewart and Ogilvie built their new factory in 1873. A jute weaving shed over a deep basement set into the hillside, giving a two storey front, engine houses of 1895 and 1915 (the tandem compound engine by Douglas & Grant was scrapped c1970). Later owned by J & D Wilkie, it closed c.2010. Power was transmitted from shafts below the floor. The north-lit roof is characterised by zinc octagonal ventilators and louvred clerestorey ventilators over the warping department. Dundee engineers Robertson & Orchar supplied the design, millwrightwork and looms. The town gasworks is on the other side of the public car park beside the factory and the burn.

AN8 MARYWELL BRAE WORKS (WILKIE'S)

Kirriemuir

NO 388 539 NO35SE 62

Jute Weaving factory for J & D Wilkie, 1869, by Robertson and Orchar, engineers, Dundee. A 1- and 2-storey factory rebuilt after fire in 1891 and with some later additions. The last jute weaving factory in Scotland switched to polypropylene in 2005, at which stage the finishing department still used five C19th calenders. See also AN7 and AN31.





AN13: Douglastown millworkers cottages, the nearest having a local 'grey slate' flagstone roof

AN9 GLAMIS VILLAGE AND ANGUS FOLK MUSEUM

Kirk Wynd, Glamis

NO38531 46816 NO34 NE54

A row of terraced houses built in 1793 became a museum of rural life using a pre-formed collection by Jean, Lady Maitland that is run by NTS. A hand loom is set up in one cottage with an earthen floor. Smiddy equipment and other handicrafts are represented. The estate village has sizeable barns to the south of the Main Street. These may have been to store the locally-grown flax that was dew-retted to break down the fibres in the fields south of the village core. This would be 18th century practice, before imports of flax undercut local produce. Villagers also quarried stone slate nearby.

AN10 GLAMIS AULD MILL

NO38591 46693 NO34NE 48

17th century corn mill, later a joiner's shop. The wheelhouse was parallel to the river but is now missing. No machinery survives.



AN11: Glamis Smiddy

AN11 GLAMIS SMIDDY

Beside road bridge.

NO38574 46654 NO34NE 66

Single storey building with a hipped roof, formerly slated, now equally picturesque under corrugated iron. Cart wheel hooping former is in AN9.

AN12 GLAMIS MILL (FLAX/ SAW)

NO38593 46510 NO34NE 51

Built in 1808 as a flax spinning mill for David Baxter, before relocation to Dundee to create the massive Dens Works (see DE 9). A steam engine was added in 1820, since removed. Later a saw mill for bobbins, with a timber launder to an internal 5.9 m diameter cast iron wheel (mid 19th century?) with rim gearing. In 2011-12 the system was upgraded to generate hydro-electricity (photographed when roof was temporarily removed for this purpose).

AN13 DOUGLASTOWN AND JERICHO

S of A94 between Glamis and Forfar

NO41686 47297 NO44 NW89, NO4275 4830

The site of the first spinning mill in Angus, built in 1788, is now a timber yard in Douglastown. The row of cottages leading to it is reasonably well preserved, as is the shorter run by the 18th

right, AN12: Water wheel at Glamis Mill
below, AN12: the Mill launder





century bridge. Cottages are 3 bays wide so not obviously for weaving. Whereas Jericho (4080 4710 NO 44NW24) nearby has wider cottages with off-centre doors for a weaving settlement, but it is barely recognisable after renovation in the 1970s. Mains of Brighton Farm is where a wagon boiler was found, now in the National Museum of Scotland. It is the farm just NW of Douglastown Mill, which had a 7HP engine added to the waterwheel before 1832: perhaps this is its boiler.

AN14 MANOR WORKS (CRAIK'S)

Forfar, E side, the Mere
NO4532 5070

1863, three storey front to a linen/jute weaving factory, the shed behind having been removed in the 1980s housing conversion. It closed in 1981. Curved corners and urns. Manor Street and Sunnyside, off Dundee Loan, has single-storey weavers' cottages with paired windows. The larger two-storey houses on Dundee Road had 4-loom shops below the living accommodation that would be let out to weavers.

AN15 DAVID IRONS' SHOP

26 Castle Street, Forfar
NO 45622 50693

Behind the perfectly preserved shop front of David Irons' hardware store, 1907, there is technical interest in the hydraulic lift powered from mains water by a vertical ram by A & P Steven, Glasgow

AN16 ST JAMES WORKS (DON'S)

St James Road, Forfar
NO4567 5044

From 1845 the winding and warping department of Don Brothers was an essential part of their putting out system to hand loom weavers. Once Don Brothers, Buist was formed in 1865 (see Ward Mills Dundee, D4, which provided the yarn) a weaving shed was built here for 700 power looms. Beside the winding building, which runs north-south and



left, AN14: Manor Works, Forfar
above, AN14: Weaving shop in Dundee Road, Forfar

has a bellcote, there are other buildings and a boardroom, recently Angus Council HQ. The modernised factory has closed and is expected to be redeveloped. Associated company tenement housing lies to the SE, built in 1877 by McLaren and Aitken.

AN17 SOUTH ST WORKS/ STRANG ST MILL

South St and Strang St, Forfar
NO4624 5065

1860s jute weaving factory by Robertson & Orchar became a spinning mill for Don Brothers Buist in 1929. This meant an extension masking the two-storey front to the first floor weaving shed -the favoured format for weaving factories in hilly Angus built by these engineers. But the large Italianate tower is still distinctive.

AN18 FINAVON DOOCOT

A90, turning to Oathlaw, north-bound before Finavon services.
NO4609 5702

A lectern dovecote, the property of NTS, is the largest doocot in Scotland, having 2400 nesting boxes. Prominent from the A90, it is not currently accessible, pending long-term repairs that are on hold.

AN19 GUTHRIE CASTLE LODGE AND RAILWAY EMBANKMENT

on A392
NO 55927 50179

For the Arbroath and Forfar Railway, 1839, John Miller engineer. At Guthrie Castle £1400 was set aside for inclusion of a porters lodge and gate in a railway embankment. Mr Guthrie built a neighbouring rail bridge at his own expense

AN20 DUMBARROW WINDMILL

off A392

NO5492 4709

A tall tower with a cantilevered flagstone walkway to access the now missing sails. Tree growth is diminishing the landscape impact it once had. As it adjoins a farm steading it probably powered a threshing machine from c1800.

AN21 LUNAN WATERMILLS

minor roads off B965

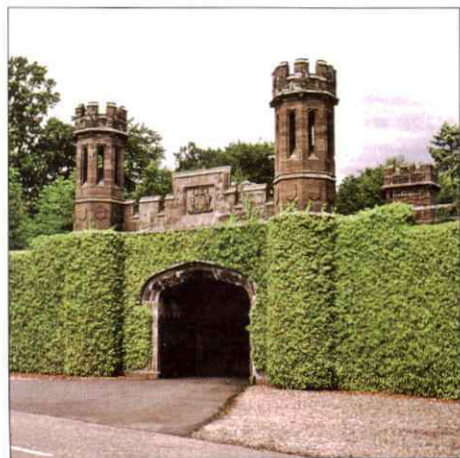
Milldens Mill NO5470 5040; Boysack Mill NO6256 4910

The small river Lunan flows east from lochs around Forfar to the sea at Lunan Bay and was attractive to the Arbroath manufacturers, in the same way that the Dighty was to Dundee, for bleaching (at Friockheim, demolished) plash mills and small water-powered spinning mills. It also has a number of corn mills along its route. (a) Milldens Mill by a bridge, Aberlemno (datestones 1685 and 1756, rebuilt 1858 waterwheel positioned to drive a threshing machines as well as two pairs of stones, oatmeal until 1930, animal feed thereafter, and not now in use as a mill. (b) Hatton Flax Mill (E of the corn mill of that name), founded in 1807, part rebuilt 1883, steam added 1826, with its own gas-holder, (c) Hattonden (1819, Wm Dear, and a 3HP steam engine from 1824, flax machinery for sale in 1848, worker's barracks still identifiable) and (d) Gightyburn (1796-1845, Williamson Bros) Flax Mills were all out of use by 1900 and now are ruinous. (e) Boysack Mill: flax spinning in 1860-67, later corn, rebuilt 1958, went out of use but was still complete when recorded in the 1980s, now in residential use.



AN17: Strang Street Mill, Forfar

Ref: Peter Solar's research, and Margaret King in Arbroath Herald Review of 1994 for the flax mills; Scottish Industrial Archaeology Survey for the corn mills.



AN19: Guthrie Castle gate and lodge built under the railway embankment

© SIHS Eric Watt Collection



AN20: Dumbarrow Windmill

© SIHS Eric Watt Collection



AR24: Brechin Railway Station, the 1895 main building

Aberdeenshire Council
Archaeological Service

AN22 STANNOCHY BRIDGE, BRECHIN

Carries B9134 over the South Esk a mile west of Brechin

NO5840 5911

Built in 1826, a 100 foot span in a single arch by James Smith is among the largest achieved in stone.

AN23 BRECHIN MECHANICS INSTITUTE,

Gusset of Church Street and St Mary's Street

NO5957 6018

Built in 1824 by artisans with a mission for self-improvement, its pepperpot turrets and tall tower make a striking location on the way into town. Railings were restored through the Brechin THL. It is still run by the community, and has inspiring portraits of the great and the good within it. The equivalent lecture hall in Dundee was the Watt Institution, 10 Constitution Rd, Dundee.

AN24 BRECHIN RAILWAY STATION (CALEDONIAN RAILWAY)

NO6017 6018

The branch line terminus had an overall roof over three tracks, the 1848 station building in the Italianate style fronting the north side. The supporting columns and brackets are retained, without a roof. The end of the line was given a new station building by the Caledonian Railway in 1895 containing the original ticket counter and station master's desk (open when trains run)

The goods depot to the south of that now forms

the workshop for the Caledonian Railway, which runs steam and diesel trains to Bridge of Dun. Clustered on the south side of St Ninians Square were practical buildings associated with the railway: slaughterhouse, bleach green, rope walk and, the town fire station, the latter still extant. The building to the east of the station on the north side of the platform was a manure works.

AN25 DENBURN WORKS (DUKE'S)

South Esk Street, Brechin

NO 6016 5997

Begun as a hand loom factory, founded in 1853, that made way to a steam powered factory in 1863. The timber-floored front, for weaving, winding and an office, was heightened from 2 to 4 storeys in 1871, reaching up into a tall Italianate clock tower. The large weaving shed had under-floor shafting and was of similar construction to Seafield Works, Dundee (DW13). The multistorey part was converted into housing in 1989, and the single storey areas were retained for industrial purposes. Some hand loom shops are in the vicinity, one in Union St later the birthplace of Robert Watson-Watt, inventor of radar. Two buildings are shown as warping factories in the first edition O.S. map, that would have been used to set up the beams for the hand weavers.

AN26 BRECHIN BRIDGE

Carries the A933 over the South Esk

NO 6044 5926

Oldest bridge in Angus, two spans in c1469, were widened in 1786 and north arch rebuilt by Alexander Stevens after a collapse.

ARBROATH AND FORFAR RAILWAY

Opened on 3 January 1839, Lindsay Carnegie was the main promoter and John Miller the engineer. Passengers had to take a 600-yard horse tram from one station to another to make their connections at Arbroath. The Gauge was 5'6", changed to standard when Dundee and Perth Railway was built, and in 1848 the line was leased to the Aberdeen Railway. It was superseded by the coastal Lunan Bay route in the 1880s but much of the route is traceable. At Friockheim a three-way junction was formed by embankments and viaducts with ribs. The medieval style of bridge construction was favoured by contractors here and further north in Kincardineshire a little later on.

AN27 EAST MILL

East Mill Road, Brechin

NO6080 5940

Flax spinning by water power started in 1799 in what was at first a flax scutching and corn mill. In 1801 the firm coined its own Brechin halfpenny with the round tower on one side and the two-storey East Mill depicted on the other. A three-storey fireproof spinning mill was added in 1837 with a bellcote over the stair tower. It is in the style of Umpherston & Kerr, Douglas Foundry, the only example left outside Dundee of the Dundee type of iron frame from this period, pre-1850. The wheel-house has been removed. Other buildings carry various datestones, the continuation to the north is pre 1821, and one to south of the original range is of 1858. The bleach works to the east experienced a fire in 1898. Now it sorts potatoes.

AN28 ARCHITECTURAL IRONWORK IN BRECHIN

NO 60261 60695

At the heart of the town, an ornate cast iron lamp standard by George Smith of Sun Foundry, Glasgow and in the park a good example of a drinking fountain and one of the larger bandstands supplied by Walter MacFarlane and Co, Saracen Ironworks, Glasgow. The roof shape was the main way that variation could be made, compared to the examples in Magdalen Green, Dundee (DW14) and in Dunfermline.

AN29 GLENCADAM DISTILLERY, BRECHIN

beside Cemetery

NO 6013 6070

Founded in 1825 and modernised in 1959. It may have more functionality than charm, but at least it has a chimney and has started to offer visits to its two stills. The other distillery in Brechin, North Port, has been demolished, with part of the art nouveau treatment of a bonded warehouse planted at the entrance to a superstore. This leaves Glencadam as the only operational distillery in Angus. It also bottles its product here.

AN30 NEW MILL (LINT), STRACATHRO

NO6053 6429

A hamlet of four mills is coursed through by a mill lade taken from the Cruik water one mile away. Mill 1 is missing, but was a flax (i.e. lint scutching) mill in 1794, and mill 2 is converted to a house, retaining the porthole for the timber axle of water wheel. The wheels do not survive, as they were probably wooden, but appear to have been low

breast or undershot. West Mill, c.1780, retains a large internal toothed wooden gear wheel. This closely resembles illustrations of late 18th century scutching mills. The internal wheel was used to drive the ground floor breaking rollers and first floor scutching box. At East Mill a turbine added in place of a wheel to the gable of a mill, within a timber surge chamber, seems to have been used to generate electricity for Keithock House. The three bay two-storey mill is likely also to have once been a scutch mill, or possibly a woollen waulk mill.

AN31 WATER MILLS EAST OF BRECHIN

Off A9135, Balbirnie, NO 63204 58485

Arrat's, NO 6434 5854

Off A934, Farnell, NO 62624 55507

a) On the same lade taken from the South Esk: Balbirnie Mill spun flax in 1825 and 1837, then became a flour mill and recently was a restaurant (not open at present). Some internal machinery (large revolving drums did the job of a kiln) was removed in 2003. A 4.57m (15 feet) diameter low breast-shot water wheel with cast-iron hub and rim has 8 wooden arms and 32 buckets. Double kiln with twin witches hats cowl. Immediately to the east is Arrat's Mill, a two-storey flax spinning mill that switched to flour milling in 1849.

b) Farnell Mill South of these on the Pow Burn was rebuilt in 1850, (dated) and has a later threshing mill extension to N. The kiln has a circular cowl vane in the shape of a pig. The internal braced wood and iron overshot wheel, 4ft (1.22m) wide
AN31b Farnell Mill, with typical Angus revolving kiln vent known as a 'piggie' because the vane was often in the shape of a pig. In front is a stone skewputt terminating the skewers on the gable of the mill.



COMMERCIAL SALMON FISHING STATIONS

A large-scale commercial market for Scottish salmon began after 1765 when John Richardson of Perth perfected the technique packing fish in ice and sent the produce to London. Numerous fishing stations grew up on the east coast, comprising a small harbour and subterranean two-chambered vaults in which fresh fish could be stored for a short time on ice before packing. Salmon fishing stations are or were also located around the Tay at Tayport, Newburgh and Perth, the Spey at Speybay, and north of Aberdeen at Murcar, Bridge of Don; Cruden Bay and Ugie, Peterhead,

A number of icehouses remain in the Montrose area, from south to north: AN34, 35, 36 and 47.

Ref: Bruce Walker, *Fife and Tayside* (1997); Jackson G and Lythe E, *The Port of Montrose* (1993)

by 15ft (4.57m) diameter is disused (electric power was used when mill was operational in the 1970s).

AN32 CRAIGO / LOGIE MILLS AND SCHOOLHOUSE

Off the A937

NO6894 6461; NO6995 6390

Craigo Mill: flax, later jute spinning mill, founded in c1800. Owned from 1817 by John Maberley, then his successor in 1830, Richards and Co, of Broadford Works, Aberdeen, then passed to J & D Wilkie of Kirriemuir from 1885 so as to ensure that firm's own jute yarn supplies. The plain between the lade and River North Esk has many drying frames of wire and steel, in order to receive fire damaged jute bales whenever there was a fire in Dundee. Here there was sufficient space to sort the jute, and deal with the spontaneous re-

ignition to which these bales were prone. A large number of timber-framed corrugated iron-clad warehouses is there for the same reason. The mill itself is mainly early 20th century, apart from the older mechanics workshop. Spinning stopped in 1988. The weir on the North Water is by Marykirk Bridge (M10)

South east, and utilising the same lade, another early spinning mill, Logie, was founded by Aberdeen Gordon and Co (subsequently at Union Street Mill, Montrose, 1837) before 1805, and continued by that firm until 1860. A small mill has been adapted as a house, with an extra storey. The little settlement for workers on the higher ground near the railway line includes Logie School House, NO6980 6353. This clay building was rescued in 2004-8 by the Little Houses Improvement Scheme of the National Trust for Scotland (Europa Nostra Award 2011) and is now rented out.

AN33 BRIDGE OF DUN

S of A395

NO6627 5842

Built in 1785-6 by Alexander Stevens, shortly before he built a timber bridge at Montrose that made this bridge seem even more of an extravagance given the superb quality of the ashlar and profusion of gothic detailing. Three arches meet at two cutwaters that extend upwards to refuges on slim clustered columns.

The railway station where starts the route to Brechin comprises a station house (private property not part of the Caledonian Railway) extensive rolling stock and a timber goods shed transferred from Nairn, now used to store diesel locos.

AN34 LUNAN HOUSE ICEHOUSE,

by Lunan Bay Hotel, Lunan, on A92 N of Arbroath.

NO 68917 51603

Built as part of the fishing station at Lunan Bay, the icehouse has a short tower at the entrance.



left, AN33: Bridge of Dun

AN36: Bothy and salt pan, later ice house at Usan
© SIHS Eric Watt Collection



AN35 BODDIN POINT LIMEKILNS AND FISHING STATION

Boddin Point, 3 miles S of Montrose
NO 713 533, NO 71307 53451

18th century limekilns built by Robert Scott of Dunninald spectacularly sited on a promontory. Coastal erosion threatens the kilns, which have been recorded through the SCAPE Trust

A 19th century fishing station comprising icehouse in a bank with a fishhouse building placed over it, a ruined bothy and harbour. The slip has been washed away.

AN36 FISHTOWN OF USAN FISHING STATION AND SALTPAN/ ICEHOUSE

On coast, 2.5 miles south of Montrose
NO 72592 54572, NO75SW 26.01

Originally built as a saltpan in 1794, this large vaulted masonry structure has been adapted as an icehouse by salmon fishermen from the second half of the 19th century to the present day. The remains of a projecting chimney, blocked ventilation windows and water inlet attest to the original function as a salt pan. Footings of an ancillary building can be seen to the south of the main structure. Nearby, a long man-made channel with grooves for a sluice gate at its seaward end is thought to have acted as a preliminary evaporation area. The remains are more extensive than at any other mainland saltworks, but production was low (3,200 bushels per year, 1795-8) because coal had to be brought by sea.

The fisher houses form two terraces with a brick and concrete water/lookout tower. There also is a coastguard station and a rocket house, where rockets were stored and could be wheeled out

by cart when needed to fire a line at any boat in difficulty.

AN37 SCURDIENESS LIGHTHOUSE,

Ferryden, opposite Montrose
NO73325675

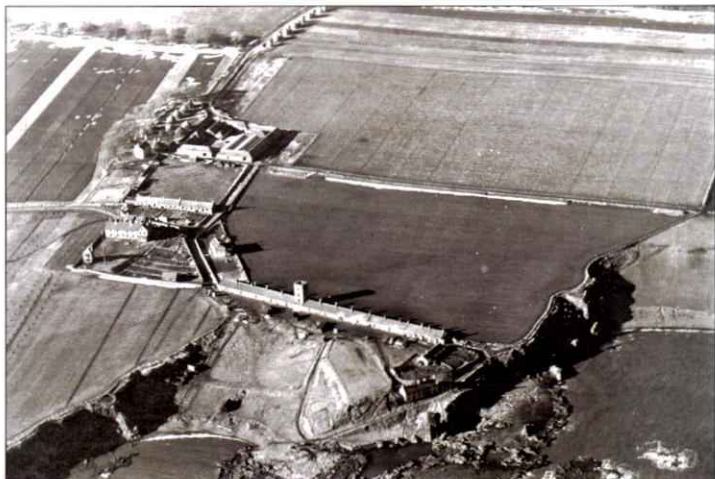
Established by the Northern Lighthouse Board in 1870, engineer David and Thomas Stevenson. A white tower 39 metres tall containing 170 steps. The nominal range is 23 nautical miles. The Light flashes every 20 seconds and was automated in 1987.

There are two day mark beacons directing shipping to the appropriate channel.

AN35: Boddin Point lime kiln in the 1970s

© SIHS Eric Watt Collection





AN36 : Air photograph of Usan fishing station, 1942. From left, coastguard station and rocket house, fisher houses behind and to the right. Farm steading to the rear. Ice house/salt pan and 'bucket pot' to gather salt water in right foreground.

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AN38 MONTROSE BRIDGE AND RAILWAY VIADUCTS

(and previous road bridges)

NO7099 5722; NO7086 5726

Road: 1828 suspension bridge by Captain Samuel Brown, his longest span at 432ft. In 1930 Sir E Owen Williams completed a replacement in homage to it: a double cantilever bridge of 216 ft main span constructed in reinforced concrete that echoed the form of the previous suspension bridge. This design led to controversy across the Atlantic: "it is regrettable that a freak structure of inappropriate design should have been allowed to succeed the previous 100-year old suspension bridge" (DB Steinmann). Its successor by Balfour Beatty is again shorter in span than the first bridge (look under the beams for the rounded piers of Brown's bridge).

Railway: a curving brick arched viaduct crosses the road and Rossie Island leading on to a multi-

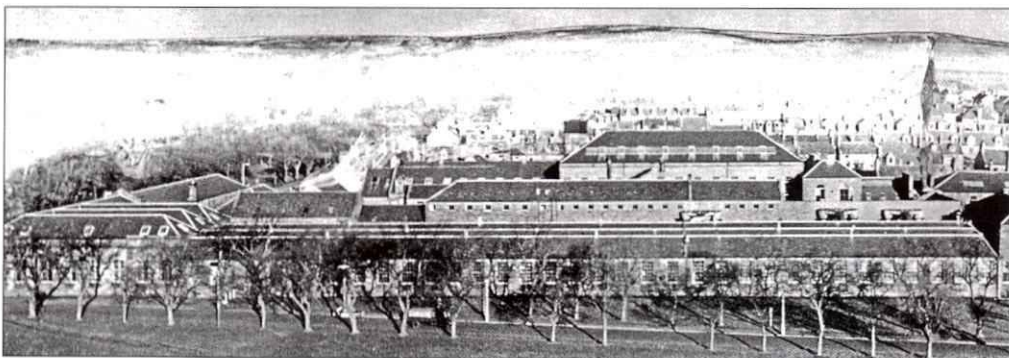
span bowstring girder viaduct on concrete filled piers across the channel. This was built in 1881-3 by Sir Wm Arrol contractors to designs by WR Galbraith

AN39 MONTROSE HARBOUR AND CUSTOMS HOUSE

NO71629 57114

The harbour developed on both sides of the South Esk channel leading from Montrose Basin. The quay edge was extensively rebuilt in 1973-5 and land reclaimed for oil support services on the south, Ferryden, side so that Rossie Island is no longer an island.

James Leslie constructed a small wet dock in 1845 but it was infilled in 1981 to give six acres of storage space on land. The pedimented Harbour Buildings had taken prime position facing that dock, three storeys and a clock, and a four-storey warehouse/ flour mill to the rear. Now they are awaiting a new use.



AN38: Cantilever road bridge by E Owen Williams, c.1980 now demolished
© SIHS Eric Watt Collection



AN40 MONTROSE AIRFIELD

Broomfield Road
NO7150 5950

The first operational military airfield in the UK was set up by the RFC in 1913. The first hangars are Indian Army patterns, timber-framed corrugated-iron clad (one with the original sheeting profiles) and sliding doors, oldest in the UK. Two further hangars of 1917 were dismantled and await re-erection in Bo'ness. A heritage centre interprets the training given here in both world wars inside the Former Station HQ. (tel 01674 678222; rafmontrose@aol.com)

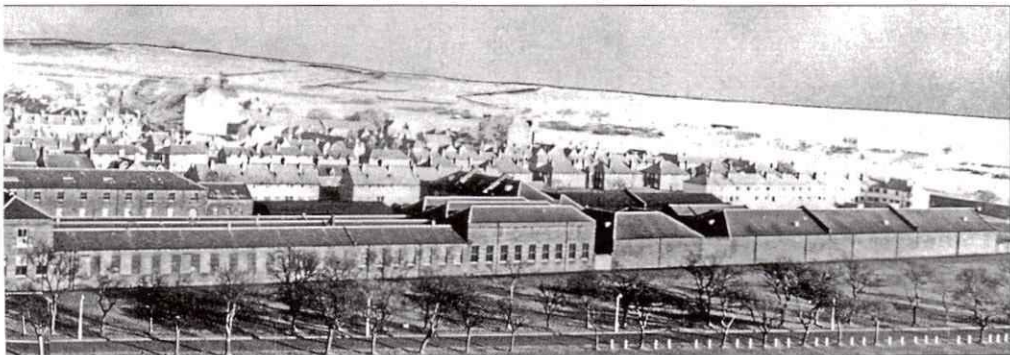
AN41 CHAPEL WORKS MONTROSE (J&G PATON'S/ GEORGE MORTON'S BOND)

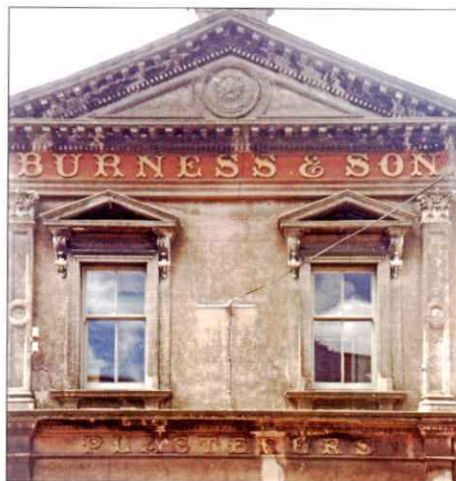
Marine Avenue, Mid Links and Patons Lane
NO7194 5770

In 1828 J & G Paton founded what became the largest spinning mill in Angus, excluding Dundee. The firm had its own engineering drawing department, but most of the buildings were put up by the Douglas Foundry, Dundee. The first spinning mills of 1828 (By J&C Carmichael) and 1833 have been demolished, but parts of the central range of hack-

ling preparing buildings that faced these survive (a fire occurred during the conversion that reduced their scale). The buildings are small-windowed and narrow in plan, but deep over a coal store that has gothic openings. Beside these is a very tall double beam engine house intended to be part of something huge, but not completed in that form. Three sturdy side walls are linked at the top by a series of cast iron inverted T-beams. Beside this is a new machine hackling building of 1845-6 with arched windows, converted to housing, and to the west a flax warehouse with architectural treatment devised to enhance the view to the courtyard (part of the complex now allocated to health care, a new clinic on the site of other warehouses). In 1867/1878 the inner courtyard was enclosed by an outer courtyard and a single-storey spinning mill giving a frontage to Marine Avenue. It forms the external walls of the housing that was completed in 2006, after an intervening period, 1973-1989 as the largest bond of George Morton and Co, rum and whisky blenders. One last phase is yet to be completed.

below, AN41: Aerial view of Chapel Works, c1960-75. Rear left, West Mill, 1828, East Mill 1833, with watertower on left and enginehouses to right. Hackling shop with small windows in front of these, and machine hackling mill, 1845, to right with larger windows. Single-storey spinning mill, built in stages 1867-78, with two-storey part by Mid Links and engine house at centre join. Raw flax warehouses to right. Copies of this print were salvaged by Angus Council Archives and by the author.





AN43a: Burness & Sons Plasterers cement rendered façade in Murray Street Lane, Montrose, behind the street frontage.

AN42 ROPEWORKS

Bents Road, Montrose

NO7196 5797

A medium sized ropewalk that used traveller wheeled carriages that twisted the rope as they moved along. There were three in this general location, aligned East-west. A distinguishing feature is the use of whale bones as guide rails for the rope walk. The last Montrose whaling ship sailed in 1839 so it is likely that these posts predate this and may once have been open air, only later to be roofed. No other complete ropewalk buildings exist in Scotland.

AN43 BURNESSE PLASTERERS AND HANDLOOM FACTORY

2-10, Murray Street, Montrose

NO7149 5836

a) A plasterers workshop showing the artistry that was achievable in the 1880s in Portland cement, coloured in the building facing a pediment that has a magnificent neo classical pediment. Facing the street the rendered treatment has a more flowing gothic style. Burness and Sons used their premises as advertisement; now a Shoe shop.

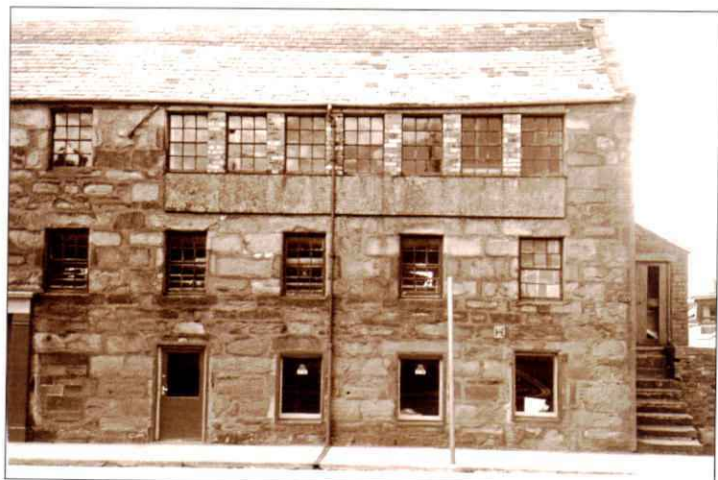
b) A three-storey canvas factory of c1820-40 in which the ground floor and perhaps first floor held the handlooms, and the top floor was a warping loft at its north end, the louvers subsequently filled with brick. The combination of brick and two types of stone - whin and sandstone - that weathered very differently led to the decision to render the whole building when it was converted into a hotel

AN44 WATER TOWERS, MONTROSE

NO7157 5883; NO 7120 6190

The burgh's situation on a spit between the sea and Montrose Basin meant some trouble had to be taken to bring in fresh water. Wells and aquifers played a part but piped water arrived in 1841 with an octagonal water tower at North Esk Road. A Tudor style helped it to compliment rather than detract from an important urban skyline. The architect was William Middleton. Now it is a private house on A92.

This was supplemented at the nearest hill to the town by a square brick tower with a castellated top built in 1910 over a reservoir, close to Sunnyside Asylum (itself one of the best set of asylum build-



AN43b: Hand loom Factory, Murray Street, Montrose, weaving below a warping loft, before conversion to Murray Lodge Hotel. It had been A Grieve Ltd, Townhead Cabinet Works and then contained a carpet beating machine.

ings in Scotland, and equipped with its own water tower and workshops). Below this at NO7132 6205 is the Montrose Town Council Pumping Station and Turbine House, rebuilt in 1914, of stone and slate. It extracted water from the North Esk, filtered it and utilised the fall originally taken by Upper Kinnaber Mills to pump water to the tower on the hill by water turbine. This system is no longer in use.

AN45 GLENESK MALTINGS

off A92

NO7180 6150

Hillside Distillery opened in 1897 using water rights of the now-closed Kinnaber Mill and the site of a bleachworks. It operated fitfully under a variety of names producing malt and grain whisky, but the last distillation plant was removed in 1996. However the maltings went from strength to strength. Glen Esk Maltings were enlarged in 1968 and 1973 for United Distillers, producing all of that conglomerate's needs. The maltings were sold in 1996 to Paul's Malts and is a landmark receiving grain and barley by road and rail. Each of 24 germination drums holds 31 tonnes of barley at a time. The 25 acre site retains the mill lade and stone bonded warehouses with gabled and curved roofs. Kinnaber Mill (operational c.1814/1867) was flax spinning downstream and to east of the lade, beside the corn mill that straddles the same lade emerging near AN46.

Ref B Townsend *Scotch Missed* (1997)

At Kinnaber junction two railway systems came together - the Caledonian (LMS) and North British (LNER). In races from London in 1895 whoever got to that point could then coast into Aberdeen with the frustrated rival stuck behind.

AN46 LOWER NORTH WATER ROAD BRIDGE AND VIADUCT

NO 7246 6218

The two bridges are best viewed by taking the minor road to Warburton ('Steptooses') on the north side, as the bends on the A92 do not suit a stop. The former rail viaduct then permits a pedestrian route to the south end of the road bridge.

The A92 Lower North Water Bridge was built in 1770-1775 by Andrew Barrie using a design of John Smeaton and contract drafted by John Adam. All three are credited in Latin, beside the major landowner. 7 arches with cutwaters, the centre having 63' span. Barrie was joint contractor with Andrew Brown.

Northwater Bridge Viaduct, a 12-arch railway viaduct, 5 of them skewed over the river, was built in 1865 for the Montrose and Bervie Railway by Blyth and Blyth. The junction between the skewed river spans and the more conventional arches required an extra thick pier. It was repaired c2000 and passed to Sustrans as part of a long-distance cycle route.

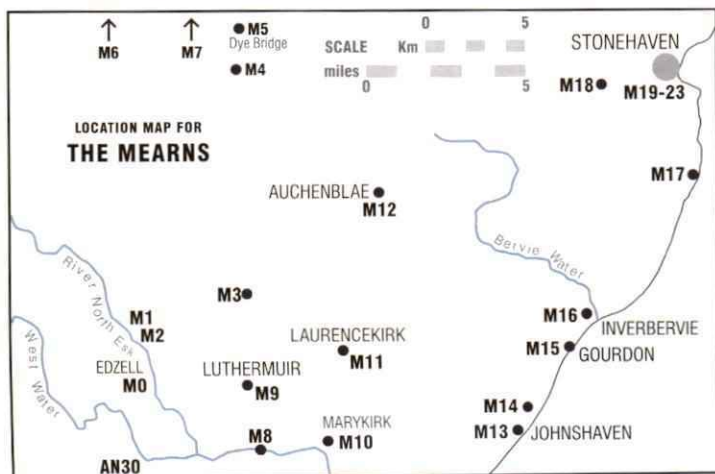
AN47 FISHERHILLS AND ST CYRUS FISHING STATIONS

On River North Esk, off A92, 2 miles N of Montrose
NO 72913 62197

And in Aberdeenshire

NO7430 6350 and NO 7470 6490

Fisherhills icehouse has the largest single barrel vaulted roof in Scotland. Joseph Johnston operated it. Two more icehouses are below St Cyrus, Nether Warburton, and, with a related bothy rented out as holiday accommodation, Nether Woodston.



This section covers the part of Kincardineshire, now within the Aberdeenshire local authority, that has most in common with Angus. The same sandstone walls and flagged roofs carry through across county lines. Farming and fishing practices are similar, if possibly still more quaint (read L Grassic Gibbon), and in Inverbervie and adjacent coastal villages there is a microcosm of the Dundee textile industry which lasted fully as long as that in the big city, but in tiny spinning mills. For convenience, bridges M0, M1, M2 that span the Upper Esk from Angus to Kincardineshire around Edzell to Marykirk, are treated here, while those at the Lower Esk, Craigo to Montrose/ St Cyrus are mapped with Angus. The Cairn o' Mount Road is followed through to the Water of Feugh at Finzean, but we stop before the Dee.



M0: Edzell Bridge, linking Angus to Aberdeenshire

M0 EDZELL SUSPENSION BRIDGE

NO6900 6030 [NOTE: SITE INCLUDED ON MEARNS MAP]

A short walk from Edzell post office. A 19th century chain suspension bridge of the Brown type, for pedestrians, between modified pylons.

M1 GANNOCHY BRIDGE

NO6002 7089

View from the public footpath at the Burn, Kincardineshire. Built in 1724, a 52-foot span over a deep and dangerous gorge. Some ribs are present in the widened structure: an even later version of the anachronism of ribs that are found also at Bridge of Dye, 1680, M5.

M2 LOUPS SUSPENSION BRIDGE, THE BURN

NO5960 7155

Take public footpath from lay-by just inside Kincardineshire/ Aberdeenshire through the designed landscape of The Burn, Kincardineshire. An intermediate stone pier carries a wrought iron pylon from which splay two sets of three chain-stays to each side. This looks to be 1820s and in the style of John Justice of Dundee (see AN1, Kirkton of Glenisla and Haughs of Drimmie bridges, Perthshire). Without decks it is no longer passable to Angus.

M3 FETTERCAIRN DISTILLERY

NO 6460 7374

1824 (the date that excise laws permitted distillers to come out of hiding in the glens), rebuilt after a fire in 1887-90, silent 1926-39 (American prohibition era), extended from two to four stills in 1966. Now it presents a line of white buildings set against a mountain backdrop. Close to, the pagoda turns out not be a kiln for a maltbarn, but



right, Louns Bridge pier and remains of bridge

M3: Fettercairn Distillery



an architectural statement that signals "this is a distillery". It works.

M4 SPITAL BRIDGE

NO6470 8470

18th century simple arched military road bridge on the Cairn O' Mount route to Ballater from Fettercairn. It has narrowly avoided replacement.

M5 BRIDGE OF DYE

NO3650 7860

Built in 1680, a 42ft 9" span humped arch on four ribs, now by-passed. The adjacent lodge, 1778 had a water-powered sawmill for bobbins and a smiddy for the Southesk, then Fasque, estates

M6 FINZEAN WOOD MILLS

From Finzean take minor road towards Ballochran, Forest of Birse along Water of Feugh.

'A rural idyll of man working in harmony with nature. Building materials are all local, scale is small and personal, the energy is free and sustainable and the hand-made equipment has the sensuous smooth patina of long use'.

Ref: Jane Geddes, *Deeside and the Mearns* (2001)

A Bucket Mill, NO5780 9130, 1853, started by Peter Brown to make wooden buckets and hexagonal floor blocks on lathes turned by a 'start and awe' paddle wheel with a double cast iron frame. Wooden launder and detached drying house.



above, M4: Spital Bridge
right, M5: Bridge of Dye

Restored in 1980s and owned by Birse Community Trust

B Piercemuir Saw Mill, NO5910 9165, c.1820, operated since 1850 by the Duncan family.

'Start and a' wheels, and the iron frame for another leans against a building on the north side of the road. Lade and retaining wall for this and the next were reconstructed in 1999. Still in use, near.

C Turning mill. More wooden buildings, one with a spectacular lean was a bus garage, used to make birch broom handles and porridge spurtles. There is a diesel generator as back-up power and for electricity generation, when not produced by water.

M7 MILL OF CLINTER, FINZEAN

NO 61170 92012

L-plan three storey meal mill. Here since 1511, dated 1819 but substantially rebuilt and re-





equipped in 1886. There is an 8-spoke, low-breast wood-and-iron paddle-wheel, 3 ft (0.91m) wide by 12 ft (3.66m) diameter and a small 6-spoke, low-breast wood-and-iron overshot wheel, which probably drove a generator. Not now in use. The kiln vane in the shape of a pig now serves as a road sign to the farm.

M8 UPPER NORTH WATER BRIDGE

NO6527 6614 on the North Esk

Built in the 1520s, or 1539, by Thomas Franche, master mason. The three ribbed arches of 52' span were widened in 1841 by John Gibb

M9 LUTHERMUIR

NO 6570 6850

Linen weaving village, some weavers continuing into the 20th century by hand loom. Most of the older houses are built of earth. claywall building techniques improved during the Agricultural and Industrial Revolutions, with the introduction



of shuttering and of masonry wearing coats. In Luthermuir this mostly takes the form of lime harl or cement dry dash, but also some decorative red brick

M10 MARYKIRK BRIDGE

NO6860 6501 on the North Esk

1811-14 by Robert Stevenson: 4 segmental arches and circular recesses in the spandrels. It was built by the team that had just built the Bell Rock Lighthouse. The 13-span railway viaduct just to the north has steel trusses of the late 1880s in place of the original timber arches of 1849. The cast iron shoes for the timber arches are still there. See Angus for Craigo.

References: Paxton and Shipway

M11 LAURENCEKIRK STATION

NO71702 71812

Opened in 1849 by the Aberdeen Railway, rebuilt c1910 by Caledonian Railway, and closed in 1967.



top left, M6: a second-hand omnibus garage now used for seasoning timber at Finzean Turning Mill

top right, M6: "Start and a" (probably meaning "starting off") paddle wheel typical of the north east, except that this has a double rather than a single cast iron ring

left, M6: saw bench at Finzean Bucket Mill see previous page



After a 50 year period when no train stopped, investment by the Railway Heritage Trust and Scotrail has seen the waiting room converted to small business units and trains do now stop again, since 2009, their numbers (86,162) twice the predicted figure. Steel canopy between bay windows. The road bridge over the line is ribbed, as are most over-bridges south of here.

M12 AUCHENBLAE MILL / DISTILLERY / DEN MILL

2 Burnett Street, Auchenblae
NO7266 7852

Founded as a flax spinning mill in 1801 (but often stated to be 1795). Gas light and steam power were added after 1830. Machinery was sold off in 1856 but spinning resumed in 1859 until the late 19th Century. It operated as a distillery from 1896 to 1926, and owes its large pagoda kiln to the work of Charles Doig in fitting this to the relatively small grist mill. Overshot wheel 11ft (3.35m) diameter, 4ft 4" (1.32m) wide, timber buckets and spokes, the rest is of iron. The distillery had operated a turbine and generator. Well converted from a garage to a house c2004, with upgraded corrugated iron lean-to.

M13 JOHNSHAVEN

off A92
NO 7594 6695

A fishing village with a large warehouse at its core. For long a natural harbour, the pier at the end of New Road was built in 1871 and a tidal basin was at last built in 1884. A lifeboat station operated 1891-1928 from a neat gabled building by the pier, and north of that is a curious circular structure. A new hand-spinning and weaving hemp factory was founded by WL Boase (of Hawkslaw Works in Leven and Rockwell Works, Dundee) in 1861. A steam-powered double shed was built in 1896 for Edwin Gibb, with its own railway warehouse (New Road, NO 79652 67168, NO76NE 82). It closed in 1937 and is now a garage.

Ref: John Simms *A Man-made Haven*, 1989



left, M12: Auchenblae Mill
above, M12: the lade leading to Auchenblae Mill
© SIHS Eric Watt Collection

M14 BENHOLM MEAL MILL AND BRIDGES

Off A92 1.5 miles north of Johnshaven
NO 80621 69077, NO86NW 12

Small grain mill dated 1711 and 1817, subsequently altered. Stopping commercial work on the death of the last miller Lindsay Watson in 1982, it was heavily restored to working order in 1987-1995 by Kincardine and Deeside District Council. New timber and iron overshot 12ft (3.7m) wheel. The roofing changed from Carmyllie-type slate to Welsh. The kiln was once detached, but later in the C19th one was attached to the mill by butt joints with a revolving, now fixed and square, kiln vent. Open to the public as a tea room that delivers training in catering and in horticulture (01561 361969). An 18th century stone arched bridge is to the north near Benholm Kirk, and another was bypassed in 1931-2 by a reinforced concrete arched bridge, FA MacDonald and Partners, 102ft span with



M13: Former lifeboat station and slipway at Johnshaven



left, M14: New waterwheel at Benholm Mill.
above, M15: Gourdon harbour entrance.

© SIHS Eric Watt Collection

castellated parapets. It is accessible from the mill visitors' car park.

Ref: guidebook by Lesley Miller, 1996, the Mills Archive and its own website.

M15 GOURDON HARBOUR

Off A92, 3.5 miles north of Johnshaven

NO 82570 70620, NO87SW 46

An active fishing harbour. Thomas Telford built a central pier in 1819. This was used to enclose the west harbour in 1842 and the Gutty Harbour in 1859. Outer breakwaters were added in 1959 and 1970, and inner storm gates were added. A barometer (1871), kipper houses and warehouses stand on the piers, and a leading light is in a brick tower on the road down the hill. The historic inshore rescue boat *Maggie Law*, launched in 1890, is displayed in the lifeboat house (tel 01561 361454)

Paxton and Shipway 2007, p69; Telford Atlas.

M16 INVERBERVIE FLAX MILLS AND BRIDGES

Off A92, 4 miles north of Johnshaven

NO 8319 7290

The first flax spinning mill in Scotland, using Kendrew and Porthouse' patent, started here in 1787. There are several small water-powered mills and

their warehouses dot the haugh, the valley below the town New Bervie, off Cowoff Cowgate, NO 8323 7283, NO87SW 68 1887; Pitcarray, by 1820, Upper, 1826 (NO 82368 73418, NO87SW 50), and Lint Mill 1832 (below Jubilee bridge), followed by three small steam powered mills up in the town: Laurel Mill (Church Street, 1877), Spring Works / Klondike Mill (warehouses off High Street, 1885, now a bus garage), Craigview Mill (High Street, 1907; closed 1992, replaced by a housing development).

There were three steam powered flax mills in nearby towns: Johnshaven, (1896, M13), Selbie in Gourdon (1908, closed 1997, demolished) and Invercarron, Stonehaven (1914, demolished). Selbie Works was the second last flax/ jute mill in Scotland, and its ability to switch from one material to another made it regarded as a barometer of the industry. These mills were able to operate as part of the Dundee industry thanks to the rail connection. Also see M12.

Inverbervie Old Bridge (NO 83143 7290) was built in 1797-9 by James Burn, 102ft (31.1m) span and 80ft (24.4m) high with vaulted embankments, chambers in the abutments reputedly a prison. It was bypassed by the curved new reinforced concrete 7-span Jubilee Bridge in 1935-6. At one end is a scale replica of the *Cutty Sark* figurehead. Hercules Linton, her designer, was born here.



M16: Jubilee Bridge, Inverbervie with Lint Mill below.

M16: New Bervie Mill, with Upper Mill in the distance

M17 TODHEAD LIGHTHOUSE

NO 8707 7695

Established by the Northern Lighthouse Board in 1897, engineer David A Stevenson. As the light took advantage of high ground in that location, the materials hauled up 50ft cliffs, the white brick tower did not have to be especially tall to achieve an elevation above sea of 41m or 125ft (c.f. St Abbs Head, Berwickshire). It has two corbelled balconies and triangular sheets of glass to the usual NLB pattern. A foghorn has been eradicated from its platform near the cliff edge. The light was discontinued in 2007 because it only marked a way rather than a specific hazard.

Ref NLB.org.uk/lighthouselibrary

M18 FETTERESSO CASTLE DOOCOT AND LENTICULAR BRIDGE

NO8438 8539

16th Century beehive doocot stands SE of the castle, with three rat courses and a slight curve upwards towards the entry point for pigeons. The unfortunate castle was destroyed by Montrose in 1645, restored in 1671 and forfeited after it was used to proclaim as King the Old Pretender in 1715. It was given a toy fort look in 1808, but retains vaults, was unroofed in 1954 and restored into apartments in 1992. A wrought iron lenticular truss footbridge in the grounds could be 1820-1860 (a similar one at Melville Castle, Midlothian was put up in 1817).



M17: Todhead Lighthouse from Catterline

M19 STONEHAVEN COVERED RESERVOIR

NO8663 7847

A c.1880 circular stone reservoir with conical slated roof, this is at a sufficiently high elevation to give water to the town below. It appears to be disused. There is a similar one outside Carnwath, Lanarkshire, which now is the house 'Hagrid's Hut'.

M20 STONEHAVEN STATION AND VIADUCT

NO86406 86196

Opened in 1849 for the Aberdeen Railway Co. Italianate, with on the south-bound platform a monopitch awning on cast iron columns with ornate scrolled brackets. Some changes were made in the 1890s, including a signal box and timber goods shed of late 19th century types. The railway viaduct running south from the station and bridging the A90 is one of several that were originally built by the Aberdeen Railway as timber laminated arches on low stone piers. The arches all had to be replaced by steel trusses in the later 19th century, on extensions to the stone piers. (also see M10)

M21 COWIE MILLS (FLAX/ CORN)

Stonehaven, E of open air pool

NO87336 86555

Spinning flax before 1824 (when machinery was



M19: The slated roof of Stonehaven Reservoir left, M20: Stonehaven Station, cast iron column detail



M21: Cowie Mills, Stonehaven

up for sale) and at intervals thereafter. This may explain the fairly large size of the building and the number of regular-sized windows. The location of the (now missing) undershot wheel towards the centre of the building suggests a dual function. In the second half of the 19th Century and until 1960 it was a corn mill with a large kiln ventilator, refitted by millwright Duncan Thompson in 1920. Converted by Castlehill Housing Association in 1993.

M22 WHITE BRIDGE, RIVER CARRON, STONEHAVEN

Near Carron Restaurant, Cameron Street
NO 8730 8576

An early example, 1879, of an arched footbridge of riveted wrought iron plate by the engineer GSHird, see also Balgay Park, Dundee, (DW9),



M22: The White Bridge, Stonehaven

and contractors Blaikie Brothers of Aberdeen (who also built Abergeldie Bridge in Deeside).

M23 STONEHAVEN HARBOUR

NO 8774 8534

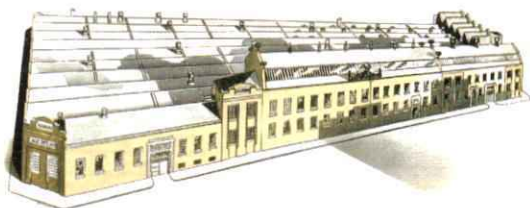
A good natural harbour formed by a bay and a rocky headland, with some of that rock incorporated into the low quay walls in the C16-C17th centuries. A sundial is fixed to the steps in front of the old tolbooth and a pier was added in 1700. Robert Stevenson advised that a stone stack (the stone in the haven?) be blown up to facilitate construction in 1826 of the south pier. This was followed by an internal jetty in 1837, forming three basins. A mass concrete breakwater completed the enclosure in 1901.

There is a pilot beacon at the end of the breakwater and two leading lights in boxed lanterns, one fixed to a granary, now restaurant, the other fixed to a wooden post.

Ref: Angus Graham, 1979; *Paxton and Shipway* 2007.



M23: The sundial and steps, Stonehaven Harbour



DE9: Eagle Mill Dundee, 1930
incorporating Baxter's Foundry, 1864
drawing by David Walker

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In memory of Eric Watt, teacher, photographer and treasurer of the Scottish Industrial Heritage Society. Some of the photos that he bequeathed to SIHS embellish this book. Unless otherwise stated, pictures are by the author, several of them taken in the course of work at Historic Scotland. The yellow artist's perspectives derive from a booklet for Low and Bonar Ltd, drawn c1950 by an art student in return for all the art canvas he needed while pursuing his studies; David M Walker went on to become Chief Inspector of Historic Buildings in Historic Scotland, and ensured that many of the key buildings in the area were statutorily listed, and in some cases, conserved and re-used. The author, also Dundonian, endeavoured to keep up that work along with the local authorities concerned. (20 textile mills are now in a housing use in Dundee, and five in Angus.)

Thank you to John Hume for achieving the definitive baseline across Scotland, 1976-7, to Jim Wood whose *Sixty Sites* (AIA, 1985) and John Crompton, *Forth and Clyde* (AIA, 2002) who drew on that, and to Roland Paxton and the PHEW team for their work on civil engineering for ICE. For their advice, thanks to Miles Oglethorpe and colleagues in Historic Scotland, Gill Poulter, Dundee Heritage Trust, many members of STICK (Scottish Industrial and Transport Collections Knowledge Network) and, for shared research on flax spinners, Peter Solar. For information, to Douglas Spears (Fife Council), Peter Verity (suspension bridges) and John Brand (Largo). For joining the fieldwork, Russel Coleman and Dave Bates (SIHS), Karen Thomson, Linda Ross, Jenn Reid and Rowan Brown (STICK), Colin and Paula Martin (East Neuk, for which we ran out of space), Paul Mitchell, Margaret King and Sarah Kettles (Angus Council), Neil Grieve and the researches of students in Urban European Conservation (Dundee University). For archives, the late Joan Auld and Pat Whatley, Dundee University, Fiona Scharlau, Angus Archives, Dundee Central Libraries, and Ian Flett and Richard Cullen, Dundee City Archives (source of Dundee harbour plans, DD6) and RCAHMS (for aerofilms and other images, a vital record). Claire Herbert, ACAS, Adam Swan, Dundee Historic Environment Trust, and particularly Miriam McDonald, RCAHMS, made edits, and the latter also prepared the Dundee maps. All maps were made fit for publication by John Stengelhofen, designer of the book.



AN28: An ornate cast iron lamp standard in Brechin, by George Smith of Sun Foundry, Glasgow

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Also for RCAHMS information see: <http://www.rcahms.gov.uk/canmore.html>

For information on lighthouses see: NLB.org.uk/lighthouselibrary

DG22: Barry Mill, Carnoustie, showing the semi-circular kiln, left, miller Peter Ellis, right and some students of the Technical University Bergakademie Freiberg, Institute for Industrial Archaeology and History of Science and Technology, from Saxony, Germany, on their study tour of Scotland in 2011



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