

Tayside and Deeside Tour Notes compiled for the 40th conference of the Association for Industrial Archaeology, held at Dundee in August 2013

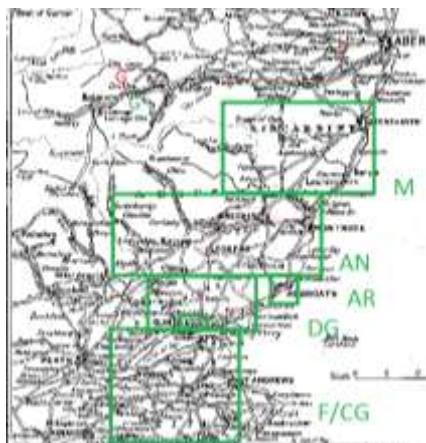
Compiled by Mark Watson, Historic Scotland and Scottish Industrial Heritage Society



Fig. Boddin Limekilns in Angus after a major collapse (compare 1993 photo in gazetteer) but before some more recent erosion, with drying poles for Usan Fisheries. This illustrates rough terrain and a need for caution (Ted Salthouse, SIHS)

The third AIA conference to take place in Scotland showcases rich industrial heritage. In 1985 AIA met in Glasgow at Strathclyde University, and in 2002 at Heriot Watt University, with the strapline 'Forth and Clyde', referring to the newly reconnected canal and to the most heavily populated and industrialised central belt.

In 2013 AIA returns to Scotland and strikes further north, taking Dundee University as a base from which to explore the basin of the river Tay. This carries the greatest volume of water of any river in the UK. The Gazetteer that supports the conference starts in Fife where 'Forth and Clyde' came to a stop, at the north edge of what was Kirkcaldy District. It covers the south bank of the Tay from Newburgh to Tayport, industries in the Howe of Fife reflecting the dual orbits of Dundee (heavy linens) and Kirkcaldy (floorcloth, linoleum). Next the gazetteer takes in the Carse of Gowrie, but would not stretch to the East Neuk of Fife or to the rest of Perthshire, which has enough of interest to warrant another gazetteer. It details sites in Dundee, Angus, and the Mearns component of Kincardineshire, now Aberdeenshire. Where sites are covered in the gazetteer, they are indicated by a letter code (F, CG, DW, D, DD, DE, DG, AR, AN or M) followed by a number. The tours that go into Aberdeenshire and Perthshire have no cross reference to the gazetteer. (Map taken from Aberdeen Official Handbook, 1951, with gazetteer area codes and the furthest points reached by tours G and I)



Industrial heritage in the region begins in Dundee's Dudhope Park for two reasons: first adaptive re-use of a factory, and first permanent industrial museum. Dudhope Industrial Museum was opened in 1900 by a committee of the great and the good, foremost among them manufacturers like John Patterson, DE1, and Provost Longair. They were impelled to act by the opportunity to acquire and display the Boulton and Watt engine at Douglasfield bleachfield, built in 1801 and of the sun and planet type. This was retrieved with the help of J&C



Carmichael, DW22, and displayed until the building was requisitioned in 1940. It never reopened, was demolished in the 1960s, and the celebrated engine has been in store ever since. There were valiant efforts by Dundee's curator, Jim Boyd, to keep the flame of industrial heritage alive despite civic equivocation. A&S Henry's, DE7, acquired in the 1970s for a museum, was soon to be scaled back and abandoned.

In this background the creation of Dundee Heritage Trust is owed in the mid-1980s to the Dundee Project (a combination of SDA and the local authorities) recognising the need to promote the distinctive nature of Dundee, and the action taken by Abertay Historical Society to acquire textile machinery from Dundee College of Technology, which was no longer to teach that subject. The pace quickened as the chance was next taken to claim RRS *Discovery* from London, and to move forward on a textile museum, a two-pronged attack led by first chief executive, Jonathan Bryant. At first Seafield Works, DW13, was in the running, but proved fruitless, followed by choice of the more self-contained Verdant Works, DW18. A book was launched there when it was still a scrapyard. The museum opened its first two phases in 1996-7.

In Angus the National Trust for Scotland plays an important part in presenting folk history in Glamis, corn milling at Barry and linen weaving at Dun and Kirriemuir. Local authority museums have valuable collections and so do local and university archives. Trusts present folk displays at Ceres in Fife, railways in Brechin and an airfield in Montrose.

Industrial museums and heritage centres have had a chequered history. No less than five local authority and independently-funded heritage sites have closed in Perthshire since the 1990s. In at least one, Aberfeldy Mill, closure as a working mill has been the making of it, as now it is an independent bookshop, gallery and cafe, with practically all of the machinery *in situ*. Benholm Mill, M14, now trains people in catering and horticulture. Some attractions are still on a knife edge, yet have seen a lot of local investment and voluntary support.

Adaptive re-use began with the conversion of Dudhope Castle to a woollen manufactory, next its late 18th century requisition as army barracks, and now service as Dundee College. And just below the castle, a tannery built in 1793 became an opportunity to experiment with steam-powered flax spinning as East Mill in 1799, the oldest remaining steam-powered factory in Scotland. With rapid industrialisation not every mill or factory was going to thrive in its initial location. Yet the combination of good water-power, an adaptable workforce and often well-built buildings could be a springboard for other industries: linen to jute, flax mill or distillery to paper mill (AIA gazetteer entries CG1, F29), to distillery (AN45, M12), to flour mill (F20, AN32), or engineering (AR13).

The end of a low-wage industry cannot be unexpected or mourned. But the legacy of buildings can be a source of pride and a demonstration to the world of ways that economic change can be accommodated through conservation of some of the best buildings and landscapes. 20 mills in Dundee are now used as homes, with two more in each of Stanley, Arbroath and Blairgowrie, and one in each of the towns of Strathmiglo, Forfar, Brechin, Montrose and Stonehaven. Collective ownership by residents and housing associations ensures the mills' long-term contribution to townscape and to local identity. Other factories still are places of employment and creativity.

Note: Tour leaders have discretion to omit or vary sites on the day.



The immediate vicinity, Roseangle to Hawkhill



Edward's Map, 1846 showing Hawkhill, now the University campus (Dundee City Archives)

Roseangle runs down from Perth Road, lined by small villas built in 1810-20, many of them by town architect David Neave. Their gardens reached the Tay shore, until cut off in the 1840s by the railway to Perth. It was here that J & C Carmichael experimented in marine propulsion and reversing gears for the Tay Ferries, then passed on machine-building to Brown and Allen, in arches of retaining walls and who also had Seabraes spinning mill ("Vision", rebuilt c1950 and c2004). The reclaimed land was given over to a railway marshalling yard and so the houses may have lost some cachet, but still have charm. One, the Vine, is a superb essay in Greek Revival architecture, 1836 for George Duncan MP. Some of its motifs are repeated at the nearby Tay Rope Works (lower left in 1846 map).

The narrow lanes from Perth Road to Magdalen Green were just the right length and slope to contain rope walks, at first open air, but soon covered, with light tramlines and horse-driven tar houses. Weaving factories were established here too, and two of them developed into powered factories: Tayfield and Seafeld Works, DW13. Other workshops were operated by the Dundee Blind Institution, and Valentine's greetings card business started here (Qwikfit, and adjacent houses in Perth Road) before moving to Dunsinane Industrial Estate. William Topaz McGonagall is listed in street directories as 'weaver' in 1878 and as 'poet' in 1882, after making his name with the Tay Bridge disaster, but his homes in 19 Paton's Lane and 48 Step Row do not survive.

Iron: some of the earliest railings in the town are here: square section balusters of cast iron or, almost rusted away, wrought iron. Adjacent to Laing's bar is the early 20th century free-flowing work of Thomas Russell, reviving 17th century wrought iron techniques to create flower finials. Another example is on Perth Road. Railings by the Tay Bridge are none the worse for a lack of paint. A bandstand by Walter MacFarlane, Glasgow, 1889, was refurbished after a local campaign in 1991. Paint scrapes only established the camouflage applied in 1940, so the colour scheme is invented.



Churches: West Church is the last standard bearer here of the Church of Scotland. It was built as a Free Church in 1884, St John's Roseangle, dislodged by University College from its original site, and has reformers Martin Luther, John Knox and Thomas Chalmers frowning from the carved street front, vigorously sculpted dogs' heads, and an O.S. mark at the back. Some items have moved from nearby churches like Ryehill, McCheyne Memorial, and St Mark's, source of a stained glass window to Canadian politician Wm. Lyon MacKenzie, born in Springfield opposite, 1795. The next two churches on the south side of Perth Rd, 1869 and 1870, are by FT Pilkington, 'rogue gothic' architect who always delivered inventively planned and beautifully carved churches. Rev McCheyne was an evangelical preacher revered by the poor, who gave him a large monument in the grounds of St Peter's, a Georgian edifice of 1836 now used by the 'wee frees'. The nearest catholic church is St Andrews Cathedral, 1836, beside DCA. Like RC Cathedrals in Glasgow and Edinburgh, it is the first sizeable church that community was able to build, not as big or grand as those built later in the more Irish working class areas, Lochee and Hilltown. The Episcopal Church also built superb tractarian churches to evangelise those working class areas, not here. Catholic Apostolic, Baptist and Congregational Churches are more central, and the one Methodist church is now a Sikh temple.

Dundee University was originally University College, substantially funded in 1881-3 by Miss Baxter, of Dens Works. It was affiliated to St Andrews University from 1890 to 1967. Of note are

- Geddes Quadrangle, for Physics 1909, and Engineering 1913 (former uses are given)
- Fleming Gymnasium 1905, adapting jute warehouses that had been built in the rear garden of Alexander Edward (of Logie Works, DW16) after that firm's liquidation. His was one of 4 villas that formed the original University College.
- Tower Building by RMJM, 1957-61, modern movement 11-storey tower. North of this:
- Old Medical School, 1904, linked by recessed glass to Carnelly (1886, Chemistry) building in 2003 by Nicol Russel Studios.
- Duncan of Jordanstone College of Art and Design, 1938/1953-65 and (brutalist)1971-4
- Belmont and Heathfield Flats replaced jute factories of those names in 1966 and 2004. Almost none of the factories, tenements and shops of Hawkhill survived the *tabula rasa*.
- DUSA, James Parr 1971-4, highly reflective glass so students can see out but not be seen.
- Springfield, 1830-51, Greek Doric, and Airlie Place, 1851-60, are well-mannered terraces now dominated by the University.
- Seabraes Court, 1995/ 2004, "Sensible but cheerless" Gifford J, *Dundee and Angus*(2012)

Opposite the Tower Building, Seabraes jute mill worked beside Brown and Allan's machinery works. It was reconstructed in the 1950s on earlier foundations and in 2006 was remodelled for use by the digital media industry. Adjacent villas have recently been released from the University portfolio, one of which was flax spinner William Brown's, DW21, subsequently Caird Rest (another jute name). Eastward on the south side of Nethergate, Queen's Hotel, 1875, anticipated to serve as a railway terminus hotel, but the Caledonian Railway moved further into the centre - its Scots Baronial tower and train shed sadly demolished. Then Provost Riddoch's house (Clydesdale Bank) -he alternated the role of Provost every two years between 1788 and 1718, doing very well for himself- and DCA, a contemporary arts building remodelled from a garage by Richard Murphy. At 134 Nethergate is a photographer's studio of 1893 –smile for the camera. Now you are in the "Cultural Quarter" in a city bidding to be European City of Culture.

Practicalities

Steps are involved in every tour except:

E: Angus steam. Caledonian Railway has even adapted a guards van to take wheel chairs.

M: Fife, but that uses footpaths and some rough ground, the latter avoidable by staying on tarmac to look at the rocky shore at Fife Ness, some 15 mins walk from car park.

In the case of A, B, F, I and J the going upstairs in mills will be brief and can be avoided by staying at ground level, still with things to see there, while others are going up and down.

Distilleries. Several malt whisky distilleries offer tours. They are foremost work places under the Factory Acts, without excessive alteration made to them for tourism. Steps are on open steel grids. The rules are: **no open sandals, no high heels, no children under eight.** Under 18s should declare themselves and should not expect a dram. If not properly shod, people may stay in the entrance area/ shop. But we will not pay for those tour places. Photography is restricted in most cases to exteriors or forbidden entirely. Admission may include shop as part of the admission ticket. Not all will be good value, but might seem so after a tasting.

Boots are recommended on tours I, J, K and M. Good walking boots, or safety shoes with steel plates, are **compulsory at the Tay Rail Bridge.** Network Rail will decline any one improperly shod or unfit. Be prepared for strong winds at the Tay Bridge: don't be like Bouch.

Friday 9 August

A 13.30 Tour starts at south door of Tower building with Neil Grieve, Tayside Building Preservation Trust, former conservation officer and lecturer, and Ian Thomson, Historic Scotland.

16.45 Tour concludes at Victoria Dock; See C

B 13.35 Tour starts at north door of Tower building with Mark Watson, Historic Scotland

15.00 walking tour concludes at Verdant Works, where people may stay or may join BTRB tour by coach to Tay Bridge.

17.00 BTRB tour coach deposits participants at Rail Station/ Discovery Point, then Victoria Dock

C 13.30 Tour starts by coach on Perth Road, drops CTRB at Tay Bridge, and collects that group at

15.15 to rejoin C, led by Rhona Rodger, Dundee Leisure and Culture, and Karen Thompson, Gairloch Heritage Museum

16.45 Tour concludes at Victoria Dock; coach brings those who wish to Discovery Point/ Rail station, or they may stay to board *North Carr* Light Vessel, and/ or view the Tay Road Bridge. The coach comes back for these people at 17.30.



Dundee Directory map, 1912, Dundee City Archives, with foundries dotted and approximate location of Friday tours (Dundee City Archives)

Tour A Dundee centre and Dens Burn
with Neil Grieve, Tayside Building
Preservation Trust

Dundee had its medieval 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 lintels to shop fronts, each corner given a different kind of a flourish by eye-catcher domes, turrets and finials.

Dundee House /Halley's Hackle Works *North Lindsay Street* NO 39986 30222, NO33SE 220. This made pins for textile machinery, then later stored ink and paper for newspaper printing, and is now Dundee City Council HQ, completed 2011. There is a striking glass addition to the roof and radial rear extensions by Reiach and Hall. Winner, British Construction Industry Awards 2012. D3.

Ward Mills/ Friarfield House *Barrack St/ Willison St/ S Ward Rd* NO 40010 30250, NO43SW 294. Don Brothers, Buist & Co offices incorporated a works canteen and high level of renaissance architectural treatment, with curved corner. A row of raw jute warehouses line the north side of South Ward Road. The two spinning mills were demolished in 1964. Foundations of a large beam engine house (1885, one of the last built) had bolts threaded through big ashlar blocks in its walls to Willison Street. Don & Low PLC now produce technical and non-woven textiles in Forfar. D4

Dundee Advertiser, *Bank Street*, NO 40199 30325, NO43SW 521. The full length of the north side of Bank Street was filled by the publisher John Leng, *Dundee Advertiser*, from 1859-1890. On the north side is a square chimney stack and a little belvedere turret. The rival DC 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 car park. The street surface is of wooden setts, showing from time to time through the tarmac. These prevent harm to typecases, should any be dropped. D5

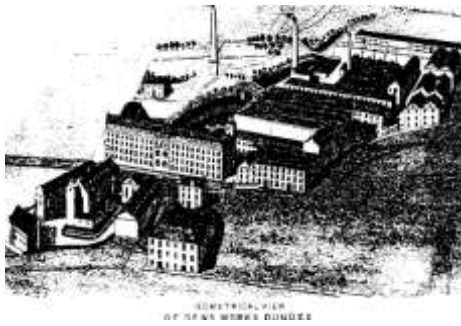
Courier Building, *Ward Road/Euclid Crescent/ Meadowside*, NO 40152 30428. DC Thomson's publishing HQ is in true American style, built 1904-6 by Niven and Wigglesworth. The first Scottish use of Hennebique reinforced concrete was here in 1902, to pile the soft Meadows. A nine 9-storey tower by T Lindsay Gray in 1960 continues the American proto-skyscraper theme. Across Euclid Crescent, Dundee High School's playground inspired the Bash Street Kids in *The Beano*. D6

McManus Galleries, built as the Albert Institute, the first so named to honour the late Prince Consort. George Gilbert Scott, 1865-8, a 13th/C14th C. Flemish cloth hall gothic with Scottish touches, extended in similar vein, 1871, 1887 and refurbished 2006-9. Some wrought iron inside, displays of local history and Victorian and other art. One of the statues outside is to engine-maker James Carmichael, 1876, supported by an engine cylinder and his fan blast invention. It is opposite the Royal Exchange, Dundee Chamber of Commerce, 1853-6 by David Bryce, its tower leaning into the Meadows as construction began, so much that the intended spire was dropped.

Dundee Calender /"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 a glaze to linen cloth). Both buildings were conserved as a training centre for the charity Helm by Tayside Building Preservation Trust in 1996. A hydraulic lift, operated from mains water, was made operational by Heritage Engineering as part of the project. Other calenders operated nearby: at Queen Street, Cowgate and Trades Lane Calenders -now the bus station. Calenders were so placed to be near the port and railway for onward dispatch of finished cloth. D13

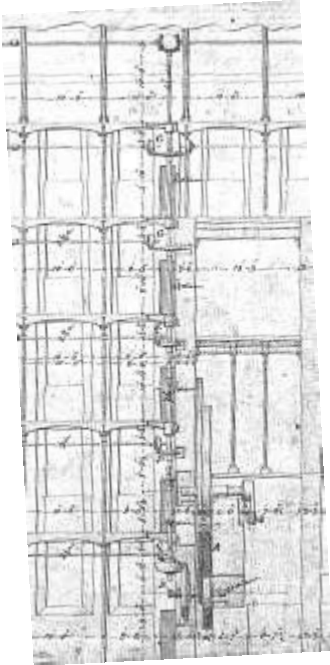
East Port Works, *Cowgate/ King Street* NO 40671 30735, NO43SW 86 This 1913 cloth finishing works was closed in 1992. Note the high ground floor for calenders, mangles and press packers, and arched openings complimenting the 16th century Wishart arch. New housing was built behind the facade in 1997-8. 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 two upper floors served as offices for Low & Bonar, the frontage remodelled in 1912. DE8.





Dens Works (Baxter's) Princes Street. Founded in 1822 by Baxter Bros, the largest linen sailcloth and canvas manufacturers in the world (*illustrated in 1856 before construction of Lower Dens mills, left*). 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 1833, and doubled by Randolph and Elder in 1850, has a double

engine house fronted by tripartite windows. This is the first mill to have adopted a cast iron gothic mansard roof, which evolved during the build, as it does not feature in the Dean of Guild or signed contractor's drawings of January and February 1850 in Dundee University Archives, but the clustered columns are in the millwrighting drawings (*left, from Baxter Clark and Paul, architects for the conversion*). The weaving shed, 1836, was on the terrace above the gothic arch. North of Victoria St, on a triple-arched bridge over Dens Burn, the works foundry of 1864 was extended as **Eagle Jute Mills** (NO 31045, NO43SW 85) in 1930. **Lower Dens Works** (NO 40797 30803, NO43SW 1050) has spinning mills of 1830s/1889, 1865, 1866 (this with a bell tower modelled on S. Maria della Salute, Venice) and 1935, each designed and built with castings in the works. Each 19th century spinning mill, and the foundry, has a gothic mansard cast iron roof. Tunnels crossed under public streets to the mills from raw flax warehouses, a pair dated 1828 in a gearwheel. 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. (*NB confined space in tunnel that may briefly be visited*)



Dundee Foundry¹, 40 East Dock Street. Marks and Spencer's 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, its apprentices going onto manage GWR and GNR Works. From 1843 new owners, Gourlay Brothers, concentrated on marine engineering, and built ships from 1854 at Marine Parade and from 1870 at Camperdown Shipyard. They engined *RRS Discovery* and *SS Robin* but 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's. A travelling crane by Babcock & Wilcox of Renfrew can be appreciated from the cafe. DE10

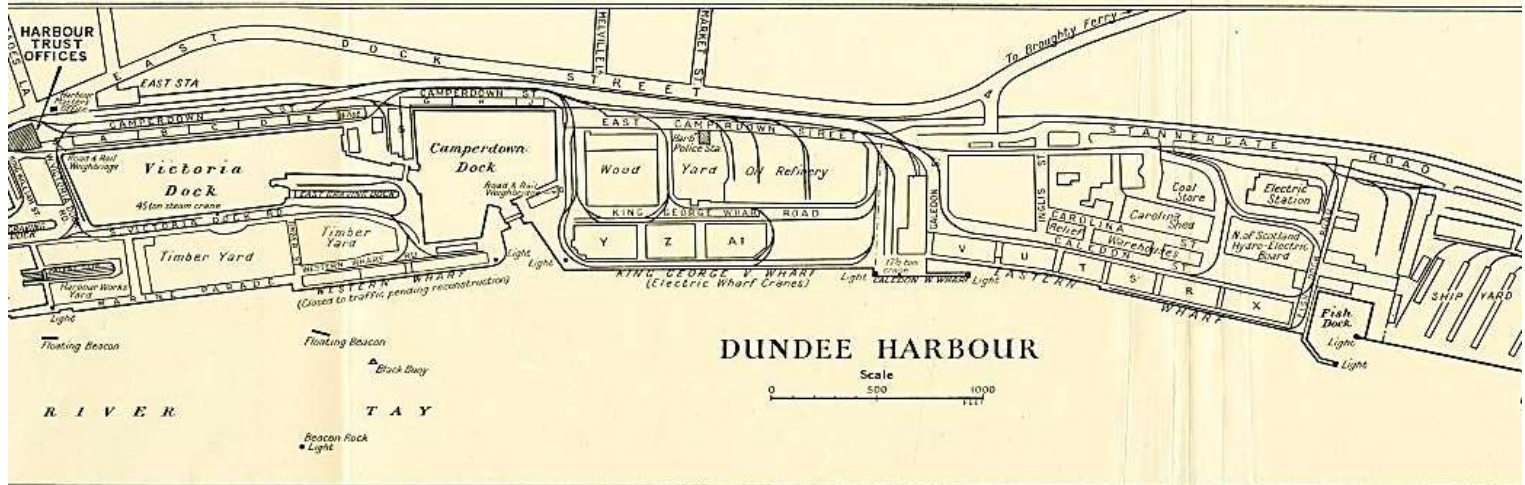
Dundee Sailors' Home, 62-63 Dock Street NO 40656 30367, NO43SW 405.00 D12. This 1879-81 building is an eye-catcher from Victoria Dock. The names of great sailors are carved into the parapet and the cast-iron, sun-burst motif may be an echo of one at Liverpool sailor's home. It could accommodate 80 sailors and had its own Chapel (gable in the lane behind). Nearby are ships' chandlers and the offices of the Dundee Perth and London Shipping Co, also built in 1881. It was recently refurbished as flats by Unicorn Properties, but the chapel is still classed as "at risk".



¹ right, erecting shop before move, cast-iron cantilevered balcony to transfer engine parts, Watson 1994

Customs House /Harbour Chambers, Dock Street NO40680 30319, NO 43SW 481. This Ionic-style public building combined functions to give it extra presence, 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, a new use has been approved. See the main stair while you can. DD4

Fig: 1952 plan in Dundee City Archives



DUNDEE HARBOUR

Information as to Wet Docks, Graving Docks, Harbours, Wharves, etc., the property of the Dundee Harbour Trustees

TIDAL HARBOURS AND WET DOCKS

NAME	Water Area in Acres	Length of Quayage in Feet	Area of Quayage in Acres	Shed Accommodation in Sq. Yds.	Depth of Water at Entrance or over Cill of Lock at High Water				Width of Entrance or Lock at Coping Level	Number and Power of Cranes
					Ordinary Springs Feet	Ordinary Neaps Feet	Highest Springs Feet	Lowest Neaps Feet		
Tay Ferries Harbour	1	845	0.37	None	19	15	20½	14	1200	None
West Tidal Harbour	4½	2,160	1.28	None	20	16	21½	15	2100	None
King Williams Dock	3½	1,420	1.89	None	15	11	16½	10	39	None
Earl Grey Dock	5	2,545	3.81	None	17½	13½	19	12½	51a	1 17½-ton crane
Victoria Dock	10½	3,860	7.83	8,800	21½	17½	23½	16½	54a f	1 2½-ton, 1 7½-ton and 1 45-ton crane 1 2½-ton crane
Camperdown Dock	8½	2,425	9.41	7,569	21½	17½	23½	16½	54a	1 2½-ton crane
East Tidal Basin (Fish-Dock)	1½	705	0.20	900	27	23	28½	22	135b	1 ½-ton crane
Totals	35½	13,960	24.79	17,269						

a Between fenders.
b Between piers.
NOTE.—Every endeavour is made to maintain the depths of water at Docks and Wharves shown in the tables, but these are not guaranteed.

GRAVING DOCKS, ETC.

NAME	Length of Bottom in Feet	Length of Blocks or Cradle in Feet	Length over all in Feet	Depth of Water at Entrance or over Cill of Lock at High Water				Width of Entrance at Coping Level	Number and Power of Cranes
				Ordinary Springs Feet	Ordinary Neaps Feet	Highest Springs Feet	Lowest Neaps Feet		
West Graving Dock	280	250	278	13½	9½	15½	8½	38	1 3-ton
East Graving Dock	500	500	516	15½	11½	17	10½	49	2 5-ton
Patent Slip	—	154	545	—	—	—	—	20	None

NOTE.—The Patent Slip, which has a lifting power of 400 tons, has a draft on keel blocks at n.w.o.s.r. of 7 ft. 9 in. forward and 15 ft. 6 in. aft.

WHARVES OUTSIDE OF THE DOCKS AND HARBOURS

NAME	Length in Feet	Depth at High Water alongside Wharf				Depth at Low Water Ordinary Springs alongside wharf	Shed Accommodation in Sq. Yards.	Cranes
		Ordinary Springs Feet	Ordinary Neaps Feet	Highest Springs Feet	Lowest Neaps Feet			
Camperdown West Wharf	(Wharf closed to all traffic pending reconstruction)							
King George Wharf	1,459	43	39	44½	38	28	16,380	1 3-ton and 7 3-ton Electric Travelling Cranes
Eastern Wharf	1,790	35	31	36½	30	20	34,541	
Totals	3,249						50,921	

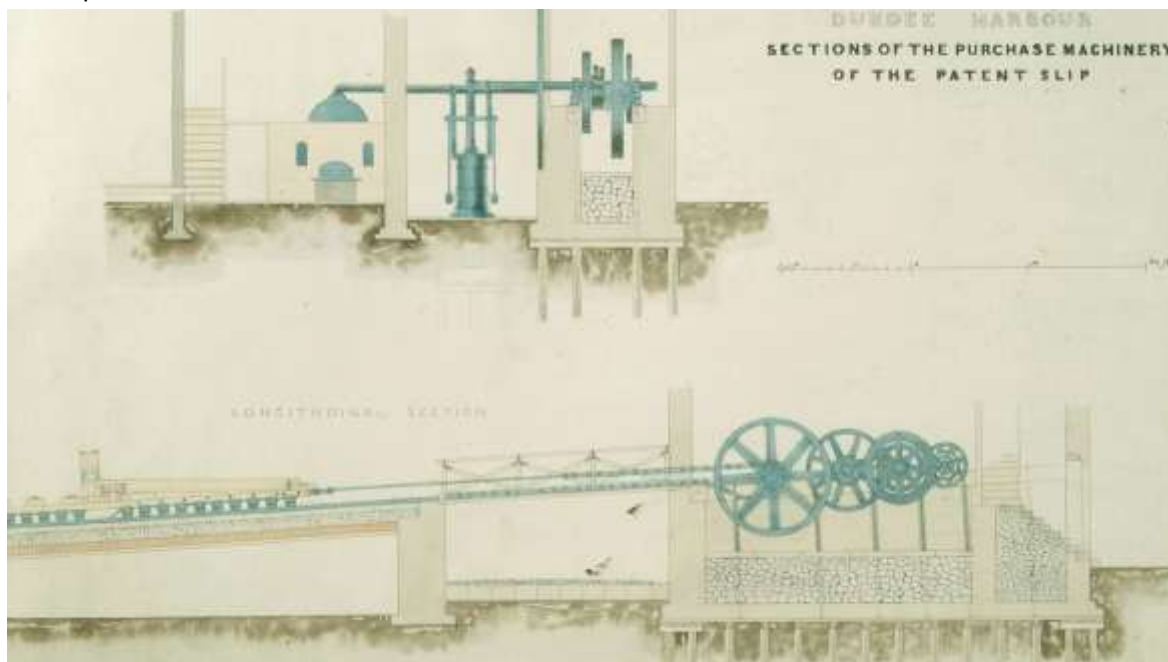
Victoria Dock DD5

NO 40958 30366, NO43SW 89; Land reclamation began in 1833 with formation of a south breakwater, Marine Parade. The 10 ¾ acre wet dock was completed in 1869-75. Leisure, retail and housing development is implemented 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 brick with regular openings for security, while the dock side was a continuous set of sliding doors between cast iron columns that double as downpipes bearing the face of harbour engineer David Cunningham. The wrought iron roof trusses curve down where each party wall has settled into the made-up ground. The sheds are now 'City Quay', an extension made into the dock. 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 allowed for a new set of balconies. The columns, on substantial Hodgekinson beams, have dividers for loose bulk goods at upper levels.

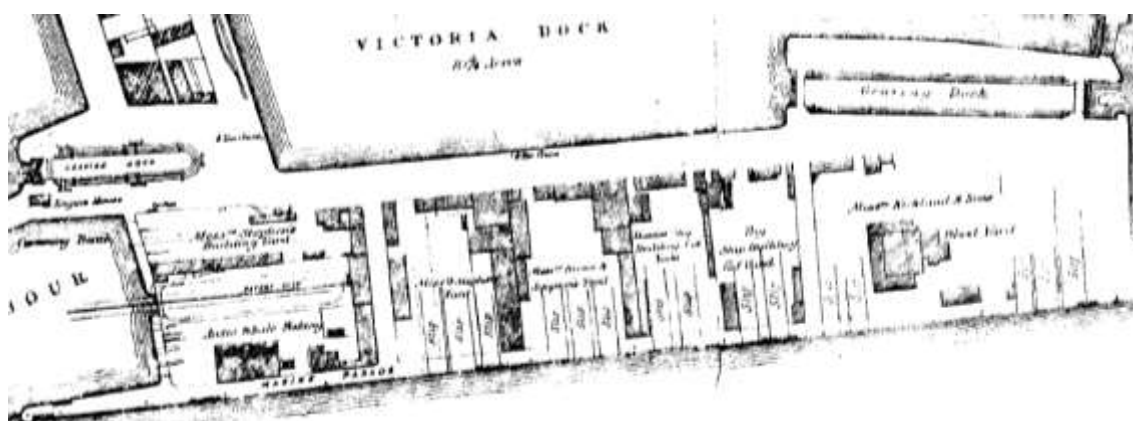
Camperdown Dock NO 41322 30540, NO43SW 90. Built in 1857-1865 by Charles Orchar, is almost square in plan. One set, oldest and broadest, of its transit sheds survives at the west side. The East side was Camperdown Shipyard, Gourlay Brothers, 1869-1908. The large drum is a 2002 storm chamber by Nicol Russell studio. Swing bridges span the entrance to Victoria Dock. 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. DD8



Harbour Workshops and Panmure Yard Marine Parade. Reclaimed ground between Victoria Dock and the sea contains the **Harbour Workshops** and steam-hauled **patent slip**, built 1837 (*fig above, drawn by James Leslie, in Dundee City Archives*) The still-visible upper part of the 545-foot ramp (NO 40870 30181, NO43SW 1001.02) shows the large dimensions of ships that could be 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, a louvred upper part rebuilt and heightened after a recent fire. Also converted to housing is the **Panmure Shipyard** of Alex. Stephen and Sons/ Dundee Shipbuilders Co. (NO 40921 30187, NO43SW 743.01). The nearest slip is that from which *RRS Discovery* was launched into the Tay in 1901, her



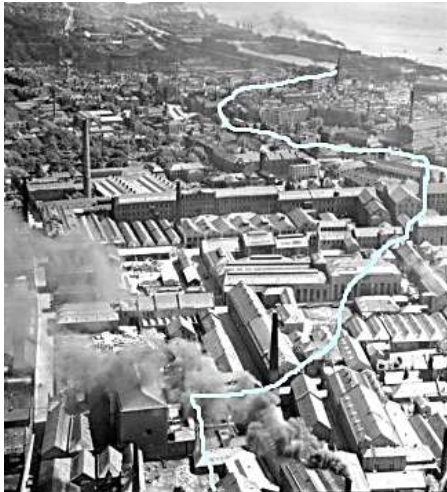
outline sculpted in granite. There is a viewing mast from which to see the Tay Road Bridge, 1966. DD6. (*fig below, 1871, Dundee City Archives*)

East Graving Dock NO 41151 30413, NO 43SW 122.00; DD7. Built in 1873 and 157m (516ft) long, this dry 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 are replaced by new apartments. The dry dock depicted in the Telford Atlas is filled in, its site under landscaping to the south of the Apex Hotel development, Dock Road.

HMS Unicorn was launched at Chatham, Kent, in 1824 and immediately placed in reserve under a roof rather than fitted with masts. This ensured long-term preservation. From 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.

North Carr Light Vessel (*Victoria Dock, access below deck limited to 8 at a time*) was moored on North Carr rock, 1933-1974. Built by A & J Inglis, Pointhouse, Glasgow (Riverside Museum site: also made paddle-steamers *Waverley* and *Maid of the Loch*). She had no engines, and her 250 gross tonnage was towed into position. Three Russel Newbury diesel compressors powered the foghorn. Now owned by the charity Taymara. Ref- Paula Martin *North Carr Lightship: a Maritime Experience*

Tour B Scouringburn with Mark Watson, Historic Scotland



Industry focused early on the Scouringburn, used for steam power from 1793 onwards. By the mid-19th century the steam from that stream was being raised and cooled many times over, stored in cooling ponds, some below buildings, supplemented by artesian wells, and then flowed on in a culvert from Blackness to the Meadows, joining Tod Burn and exiting to the sea near Commercial Street. Some of the poorer housing in the city was here, but most was removed in the mid-20th century, leaving two pubs on Brook Street. Blackness Industrial Improvement Area was active in 1981-4 implementing a programme of public art, building facelifts, chimney demolition and road widening to try to retain industrial uses in the area. That investment has adapted and incidentally conserved an urban textile landscape through conversion and selective demolition. A core area designated a conservation area in 1990 is possibly Scotland's most coherent urban industrial area.²

South Mills (flax) Ltd (NO 39720 30255, NO33SE 81), Session St, (1825), and Brown Street, (1850s, 1864 and 1875, dated pediments, right). Founded by J&W Brown, then expanded by son in law O.G. Miller. The fireproof, high mansard, gothic cast-iron roofed mill was converted to housing by Cleghorn Housing Association in 1999-2000. The centre opened out via a colonnade to a preparing shed over basement storage and cooling ponds. The engine house has long been cut through for vehicular access. The pub opposite was Brown Street public school, linked to the Free Church. DW21



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, 20HP (at the slightly larger window just right of the shop windows). It was owned by J&W Brown from 1809, and William Brown's account of the management challenges and his solutions are printed by the Abertay Historical Society in JR Hume, *Early Days in a Dundee Mill*, 1819-23, (1980). "Ever since my 18th year I have been almost closely occupied toiling in a ruinous mill." See map, p11 for the other Brown mills.

The oldest steam-powered mill in Scotland is a full three storeys, though part is below street level. It was later extended to the west, and was a pattern store by the engineers J&C Carmichael. Now it sells kitchens and bathrooms. DW21

² Fig: course of the Scouringburn overlaid on an Aerofilms photograph, 1928, Milne St Mill, Verdant Works, South Anchor Mill above smoke. Tram power station, with biggest chimney, Tay Works and Ward Foundry in middle distance (© crown copyright, RCAHMS).



Tay Works (Gilroys', DW23) *Marketgait/ Brown Street*. The long and perfectly proportioned neo-classical ranges for jute spinning and carpet weaving (NO 39790 30350) were built 1851-65. A giant pediment incorporates the initials G R & A Gilroy and the higher pediment

(1862) once sported a statue of Minerva. Behind this is a gothic cast iron roof, while the rest of the roofs are wrought-iron. Joseph Lindsay was the in-house engineer, founding partner of Urquhart Lindsay & Co. These are now student residences. To the rear, the fireproof L-plan Hospital Ward Mill (William Boyack's Old Mill, NO 39741 30379, NO33SE 581), 1835-6, a beam engine house of 1851 for a weaving shed (other engines were within the multi-storey mills). Dyeworks, 1922, and, south of Guthrie St, are Tay Calender (NO 39796 30304, NO33SE 73; now Travelodge) and a cloth warehouse, 1881. (fig Adam Swan, Dundee Historic Environment Trust)



Ward Foundry, DW22, *Brown, Guthrie, Miln and Session Streets* NO 39658 30353; NO33SE 233.00. Established in 1810 by J & C Carmichael to make steam engines. On Miln Street, a corner building of 1851-6 and a Moulding Shop, 1883, with big bressumer to the back. The boiler shop, 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 had been on Brown Street, the building with heavy buttresses at the back. 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 since used for paper storage by DC Thomson, it has various uses on Brown Street, and a mosque in its midst.³

Dundee Industrial Association (DW17) provides shared services for small businesses and artists in mills amalgamated in the 1920s by JF Robertson: Douglas Mill, Douglas Street, (NO 39351 30442, NO33SE 114) 1835, later made fireproof (post 1857, as column capitals are a type used by Robertson & Orchar engineers) with an arched cast-iron roof and a beam engine house whose cylinder foundations are viewable from the stair threaded through at that point, and Meadow Mill, West Henderson's Wynd (NO 39438 30444, NO33SE 62), 1874, four-storey fireproof mill by Urquhart Lindsay and Co, Blackness Foundry. A WWII fire-watchers shelter is on the roof. The top three floors are now WASPS artists' studios.



For Verdant Works see Wednesday Tour K/L. For the Tay Bridge see article in Resources Pack reproduced by permission of Dundee Civic Trust. DW18 and DW15.

Left, J & W Brown mills highlighted in Edward's Map, 1846. Douglas and Ward Foundries take the rest of the block north of Guthrie St containing Brown's North, East and Column Mills. The Hospital Ward Mills of Wm Boyack, later Tay Works, are left of Tay Street and the prison. Dudhope Works is the first weaving shed in the area. Its chimney is shown on the north side of Douglas Street, 1839. (Dundee



1st Edition
O.S. 1:500
scale map,
surveyed in
1856,
courtesy of
National
Library of
Scotland

South Anchor Mill, Anchor Lane (NO 39432 30348, NO33SE 272), c. 1845-50, is part fireproof and has a curved three bay wide cast-iron roof (oldest in the city?), ground floor extended into a preparing room 1851-6, an 1860s engine house; weaving shed c 1857-64 and later with its own engine house. The second timber floor has had some fire-resisting measures added to it, short of full fireproof brick arches. The mill was extended to the east in 1882, and again more recently, under cement render. Sold to A & J Adie in 1850, from estate of the late Matthew MacKenzie (with 18 HP engine), and worked by D McMaster from 1897. Now it is let to various uses.

Tour C Transport and Docks

with Karen Thompson, Gairloch Heritage Centre and Rhona Rodger, Leisure and Culture Dundee,

Dundee Transport Museum is a new venture started by volunteers around a private collection to which items are being loaned, such as a Fowler steam roller from Angus Council. It has benefited from temporary curatorial advice from Leisure and Culture Dundee, and has the use of a council unit formed where was the municipal abattoir in Market Street. The long-term plan is to obtain the former Maryfield tram depot on Forfar Road and display the transport collection there.

[**DC Thomson** is a major publishing house, its titles including the *People's Friend* and *the Beano* besides regional dailies, the *Courier* and *Evening Telegraph*. The Broons and Oor Willie are cultural institutions. Key artist Dudley Watkins (Little Plum, Dennis the Menace) lived facing Kingsway, and murals attributed to his handiwork were found in his house. The main printing works on East Kingsway is within what was formerly Stewart's *Cream of the Barley* whisky bottling plant. See also gazetteer sites D5, D6 and DW20. *Stop press, no longer possible, so we are considering options.*]

For Clocktower Warehouse and the Wet Docks see Tour A.

RRS Discovery (*Discovery Point, Discovery Quay*) was launched in Dundee by Dundee Shipbuilders Ltd in 1901 for Captain RF 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. Engined by Gourlay Brothers, DE10, the sails supplied were by Baxter's DE9. She is managed by Dundee Heritage Trust and is moored in Thomas Telford's Craig Harbour, formerly for the Tay ferries.

Sunday 11 August coaches start from Perth Road near Tower Building at 13.00 (E) and 13.30 (D and F), returning at 18.00

Tour D Perth and Stanley O.S. Landranger 53

By coach with Chris McGregor, HS, and Russel Coleman, SIHS and Headland Archaeology

Perth Old Bridge, (look right on Queen Elizabeth Bridge) NO12123 23885 NO12 SW, was built to the design of John Smeaton in 1766-72. Bridges had previously crossed at Perth but were missing for more than a century. It has nine arches with dressed masonry arch rings to give the impression of piercings



through the rubble spandrels (as actually done at Pontypridd). It was the inspiration for other bridges in the region, like Lower North Water Bridge. In 1869 cast iron footpaths were bracketed out to widen the carriageway. A D Stewart, Glasgow, is named on the lamp standards.

Perth Waterworks, Tay Street and Marshall Place, NO120231, facing South Inch beside the Tay, next to a later railway viaduct, the "Round House" is a temple to public water supply opened in 1832. This was one of the earliest examples of a filtered public supply, successfully using the "natural filtration" method, which notoriously failed to give Glasgow a good supply. Water was collected from under a natural bed of sand and gravel on Moncrieffe Island in the Tay. Mathematician and schoolmaster Adam Adamson was its main promoter. A domed rotunda/cistern on top of the building is of cast iron by Dundee Foundry. The adjoining rectangular engine and boiler house has an ornate chimney topped by a Grecian urn. This "Water House" remained the town's pumping station until 1965, and the last steam pumping engines in Scotland to be used for public water supply were subsequently scrapped. The building was made into a tourist information centre c. 1980 and is now the Fergusson Gallery (after the artist JD Fergusson). The cistern was found to be in poor condition, so was carefully dismantled and reassembled around ten years ago.

Perth General Station (NO112231) was built from 1847 for the Scottish Central and Edinburgh, Perth and Dundee Railways. It has a girder train shed over some of the platforms. The architecture, and the detail of the ramps, has much in common with Carlisle station. At one time this important hub belonged jointly to the Caledonian, Highland and North British Railways.



Perth in 1931. The Lade runs past the Monax Glass and Ink Works top left, Upper and Lower City Mills, Public Baths and Wash Houses, now the bus stops in front of the cinema, and Pullar's Dyeworks. Courtesy of National Library of Scotland

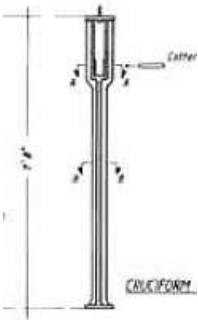
Perth City Lade. From the River Almond, 4 miles W of Perth, NO069257, Low's Wark is a weir on the River Almond, medieval in origin. From this, via a large wheel at Shepherd's Mill, the Lade passes around the old town and at one time moated it, taking several branches to enter the Tay at different points. In addition to Pullar's and City Mills, described below, it supported many industries, textile, oil-milling, Perth Foundry, and printing until the 1950s. A coal wharf with barge moorings occupied its lower end, where the town's first gasworks were built. It supplied the town's first piped water, public washhouses 1846, and a swimming pool, 1889.

Perth City Mills, West Mill Street, NO114237, were so named long before city status was granted in 2012. The Upper Mills, turned into a hotel and restaurant, retain two internal low breast wheels, one 18ft diameter by 12ft and the other 13ft 6ins by 5ft. Lower Mills are virtually complete with sluice, large wheel 14' diameter and 12'3" wide, three pairs of stones, ancillary oatmeal machinery, kiln and granary. They had been a visitor attraction 1989-1999, operated as a working mill by Perth and Kinross District Council, and now are occupied by VisitScotland, not normally open to the public.



Pullar's Dyeworks, NO1169 2379, founded in 1824, grew to become one of the biggest dyers in the country, thanks to its mail order business, taking deliveries by rail, and returning clothing dyed black, in memory of prince Albert, or some other colour. With Tulloch Dyeworks (1883, far away due to fire risk from naphtha and benzene used in dry cleaning) and in 1912, even before joining with P&P Campbell (1919), there were 2,160 employees and 4,000 agencies. It closed in 1993. On Mill Street, built in 1863, the two storey pedimented dye house and mail order department was converted to the Council HQ in 1995-9. Beside it, c. 1890 crow-stepped T-plan parcel post warehouse (proposed hotel). In similar style in Kinnoull St, a 4-storey boiler house, dress making and fur dept, 1896, and round in Union Street was a fireproof silk cylinder and velvet framing block, 1871. One bay of its Dundee-type gothic 2-bay cast iron roof is fixed to a multistory car park.

Stanley Mills (Historic Scotland), Stanley on N bank of River Tay, 8 miles N of Perth. NO114328. One of the best preserved of the water-powered cotton spinning mills in which Richard Arkwright had an interest. Arkwright, seeking an introduction to Royalty by MP George Dempster of Dunnichen, combined with several Perth merchants and the landowner to found the company in 1785, where a corn mill had stood since 1729. The mills closed in 1989 and became derelict while the owner sought to fund development. Historic Scotland was able to buy them in 1995, with support from the Heritage Lottery Fund, and has guided the conservation and interpretation. The end use as housing for the majority of the mills was the first project of the Prince's Regeneration Trust, and won a Europa Nostra Award in 2009. The various parts are as follows:



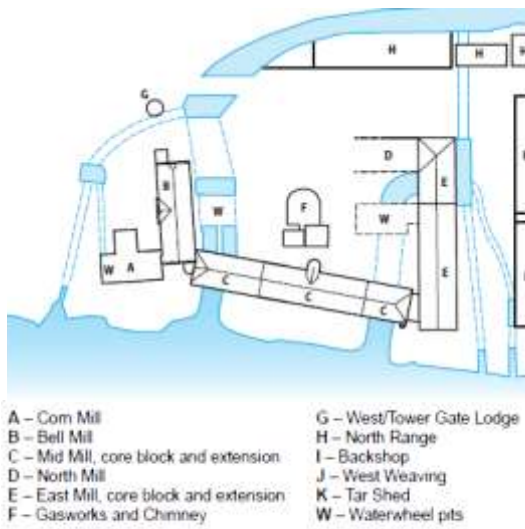
Bell Mill was built in 1786 and was spinning 'water twist' in 1787. A floor was later taken out to combine ground and first floors. Yet it is arguably the best-preserved mill with which Sir Richard Arkwright had direct involvement. It is the oldest, thus far known, to be fitted internally with (cruciform) cast-iron columns (*fig. Ron Fitzgerald, from "Force and Fabric" 2011, (crown© Historic Scotland)*). There is evidence of heating flues running through the walls. The weaving of cotton belting began here and in the adjacent shed (on the site of a 1729 corn mill), at the end of the 19th century. The belts were made durable by dipping them in a tar tank that survives at the foot of the stair.

Mid Mill,⁴ built in 1823-5, was lengthened to either end circa 1830-40 (note changes in stone colour and differing styles of internal castings, the capitals integral with beams, not the tubular columns). The fireproof mill was used for cotton blowing and carding, requiring heavy machinery and carrying a high fire risk. This was converted to nine houses by the Prince's Regeneration Trust, 1997-9.

East Mill was noted as "near unfinished" in 1796, burnt down in 1799, and rebuilt in 1802-9, for flax and cotton spinning. It was enlarged in 1823-5 and altered after yet another fire in 1848. It carried ring spinning frames and doubling machines in 1892. This mill was converted to 30 flats in 1997-9, and the archaeology of the transverse C18th wheelpit recorded.



⁴ (*fig, Stanley Mills, showing the power canal coming via a tunnel on the right, mostly diverted to the power station at the bottom in 1921. Top to bottom: Bell Mill of 1786, Mid Mill, a fireproof mill of 1822 and later, and East Mill, built 1794, modified after fires, form a U-shape. [RCAHMS: Crown Copyright]*)



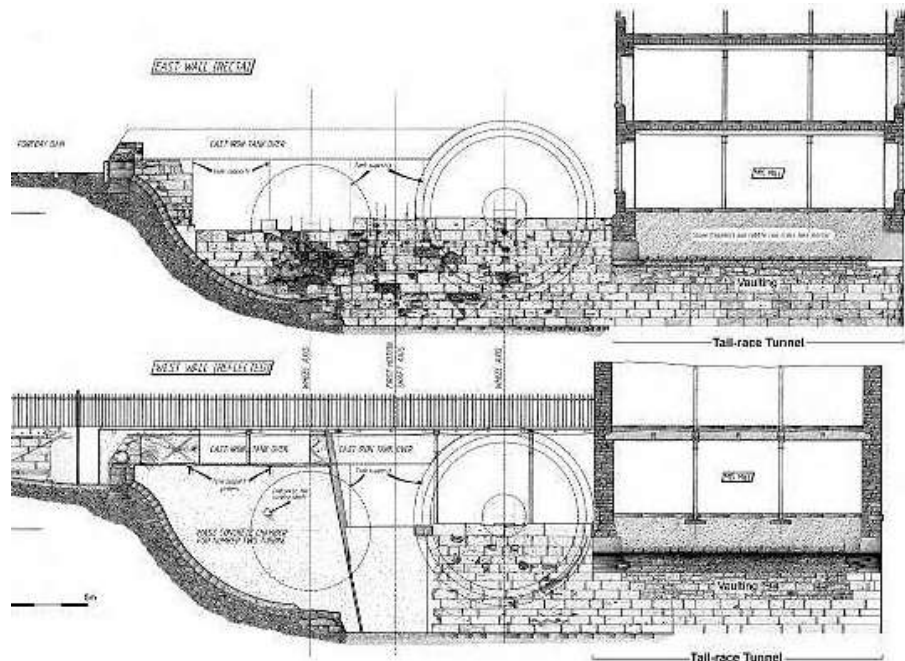
A – Com Mill
 B – Bell Mill
 C – Mid Mill, core block and extension
 D – North Mill
 E – East Mill, core block and extension
 F – Gasworks and Chimney
 G – West/Tower Gate Lodge
 H – North Range
 I – Backshop
 J – West Weaving
 K – Tar Shed
 W – Waterwheel pits

North Range was for hand weaving, then a calender for finishing cloth and latterly a cigarette tape-making department was here, with an office and a clock. **Entrance lodge**, ogee roof, and another lodge leads to the owner's Stanley House, picturesque Gothick in the style of Scone Palace. A **gasworks** was built in 1823-5 to light the mills, enabling spinning from 5.00am to 7.00pm. This was particularly important to water-powered mills, so many of the earliest gasworks were established in rural locations. A water-lined circular tank sealed the gasholder. The chimney was 40 m high but has been shortened. No steam engines were ever here. **The Back Shop and Bleachworks** also date from

1822-5. Part was used for weaving by hand and power loom (there is a small water wheel pit). It adjoins a cotton warehouse and a stove with underfloor heating to dry starched warp yarn. (fig @ Historic Scotland)

The Wheelpits date from 1823-7, when seven wheels were turning at the site, four of them in these pits between Bell and Mid Mills. Archaeological excavation by Ron Fitzgerald has explained several curious features, such as the stone work shattered by the action of the wheels, and methods of conveying power below a door at Mid Mill. A concrete container for a turbine fills one wheel pit, but the power take-off into the basement is 18th century, big enough for a timber axle.

Sections through wheelpits and Mid Mill with possible arrangement of wheels, drawn by Ron Fitzgerald, in Cressey M and Fitzgerald R, "Force and Fabric" 2011, (crown copyright Historic Scotland)

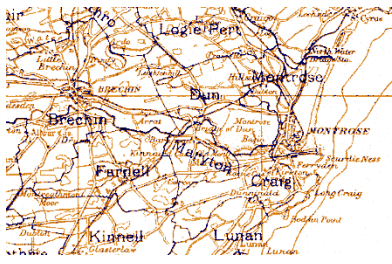


A hydro-electric power station was built in 1921-2. Boving turbines were coupled to a 450KW generator for all the power and light required in the mills, and much of that in the village, until abandoned in 1965 and turbines were removed. Restarted by RWE-Innogy, generating 0.84 MW.

References : Cooke A, *Stanley: From Arkwright Village to Commuter Suburb* (2003) and Cressey M, Fitzgerald R, *Force and Fabric: Archaeological Investigations at Stanley Mills* (2011)

Kinclaven Bridge, by JE Harrison, 1903-5. A mass concrete bridge on six Tudor arches, clad in stone.

E Sunday 11th Angus by Steam and Air, O.S. Landranger 54. By coach with Sarah Kettles, Angus Council



Caledonian Railway is operated by Brechin Railway Preservation Society. It was founded in 1979 as goods services were coming to an end, the station closing in 1981. The 1848 station is on the north side, its train shed indicated by columns. A terminus facing St Ninian's Square

was added in 1895 and retains clerks' counters, manager's desk etc. *The goods station for loco maintenance is out of bounds.* It operates a 4-mile run to what was the terminus at Bridge of Dun. The timber goods shed came from Nairn station and now houses the diesel locomotives. *Note that Bridge of Dun Station is a private house. Please stay on the NW platform.* AN33 and AN25



Montrose Air Station Heritage Centre tells the story of pilot training in a Headquarters building of 1935. The collection includes a Gloster Meteor loaned by 603 Squadron (01674 678222).

Montrose Airfield was the base for Numbers 1 and 2 Flights of the Royal Flying Corps from 1913, and trained airmen in the First and Second World Wars. The three side-door hangars still exist and are believed to be the oldest built for the military in the UK. They are adaptations of Indian Army patterns, timber-framed and corrugated iron clad. Two end-door black hangars of 1917 are in Bo'ness, Falkirk, awaiting re-erection. Metal portal frame hangars are of the 1936-45 period, like one of 1940 north of the museum.

Ref Hay and Stell, *Monuments of Industry* (1986)

Sunday 11th tour F photo circuit of Bonnie Dundee: O.S. Landranger 54 (gazetteer DG, DE, DW) from an open-topped Taybus Vintage bus with Mark Watson

Michelin Tyre Factory, Baldovie, Dundee, opened in 1972 and produces seven million radial car tyres per year. Two recently-built wind turbines are together rated at 4MW, with a fair wind, generating a third of the energy requirements of the tyre plant on a 28 ha (70 acre) site. Two 2-megawatt wind turbines are each mounted on an 85m (278ft) tower, with three blades of 71m (232 ft) diameter.

Below, Linlathen East Bridge, before repairs, derived from digital scanning by CDDV



Linlathen East Bridge is on a straight drive to Linlathen House, now a new Nursing Home. A precise date is not known but it appears to follow the 1795 patent of Thomas Wilson and Rowland Burdon MP, deployed at a large scale over the Wear at Sunderland in 1796. It meant separate open-work voussoirs of iron hoops held together by wrought iron straps instead of single large castings. The diameter of the hoops diminishes in

size towards the centre of the bridge, and in the Linlathen case the larger hoops are wrought iron, beginning to buckle, while the smaller circles are cast. The abutments are angled to better support the thrust of the bridge, (like Malapane in Silesia, 1796, destroyed). The underside of the deck is trussed, like work by blacksmith John Justice Junior at three at Glen Isla, Haughs of Drimmie over the Ericht, and at Balmoral (tour G) in 1818-34. Linlathen bridge may be a precursor to these. It was on the estate of Thomas Erskine, theologian (1788-1870). Smaller iron bridges are found on the Erskine family's Cambo estate, Fife.

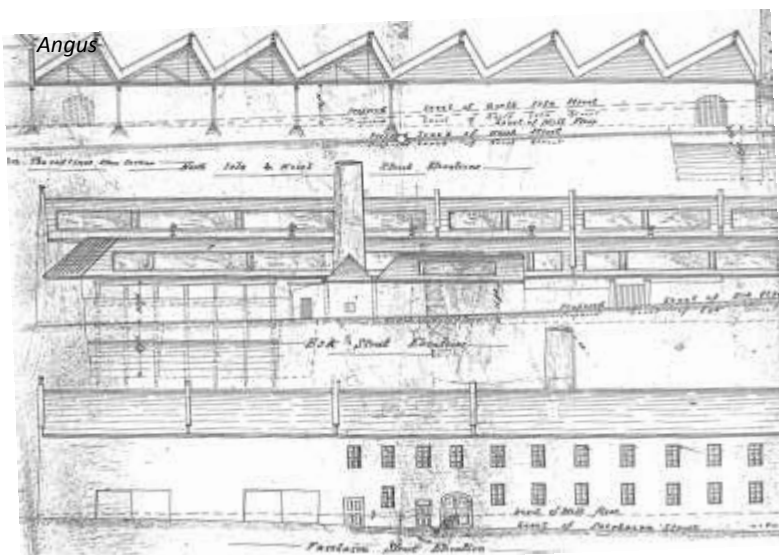
Planning gain from a large greenfield housing development has rescued it from terminal decay. Repairs implemented by Dundee City Council won Historic Bridge and Infrastructure Awards, 2012

Linlathen West Bridge is a more conventional, c 1840-50, each rib of two pieces, with cast iron balusters. It is on a more circuitous drive through the designed landscape as was fashionable in the early-mid 19th century. Both cross the River Dighty, where it was briefly bucolic before heading into another bleachfield, Panmurefield, also now surrounded by housing developments. (DG15; DG16)

Barry Mill (NTS) 2 miles west of Carnoustie on A930, NO53411 34966. DG22. This fully-working water-powered oatmeal mill dates from the 18th century, was rebuilt 1814 and re-equipped in the late 19th century. The semicircular kiln is a distinctive Angus feature, and at one time had a wallhead that matched the mill. It worked commercially until 1982, was bought in 1988 by The National Trust for Scotland and has again operated since 1992. 4.6m diameter wheel. Oatmeal milling is demonstrated and a walkway leads along the lade to the mill pond. An apprentice is funded by Historic Scotland to continue the operation when the current miller Peter Ellis retires.

Broughty Ferry Station, Gray Street, NO463309. The oldest railway passenger awning beside a live line? The Dundee and Arbroath Railway opened on 6 October 1838. A two-storey booking and parcel office with ornate bargeboards stands beside a timber kingpost awning for passengers and waiting rooms. The shelter is steeper in pitch than at any subsequent station. 9 iron columns stand on stone plinths: the platform height has risen around these. A siding accessed workshops at Brook Street, perpendicular to the line. A timber cabman's shelter of 1907 is N of the track, still today advertising taxis. The railway, and later trams, allowed Broughty Ferry to adapt from fishing village to suburb. Uphill is the lodge of Castle Carbet, home to Grimond of Bowbridge Works and second largest jute baron house in the city. The big house has been demolished, save salvaged painted ceilings.

In 1999 Railtrack sought to demolish the surface buildings of the station. Listed Building Consent was refused and instead later accretions that obscured the canopy were removed along with a timber footbridge (1877, twisted) and signal box (1887). The latter was re-erected in 2012.



Works, 1879, Police Commissioners Approved drawings, © RCAHMS

The tour next goes past sites in the DE section of the gazetteer, with a specific stop at **Angus Works**, Fairbairn Street, 1879, built by Thomson Brothers engineers as a single storey jute spinning mill that they would own, and ultimately was a part of Jute Industries Ltd. We shall see an industrial unit that is



for the moment empty formed within the mill c1982. It the right arrow in the map below, and Camperdown Works is the left arrow:



Dundee's telephone network in 1880. At the end of each line is a mill, Cox's office and the Docks. (Police Commissioners Records in RCAHMS)

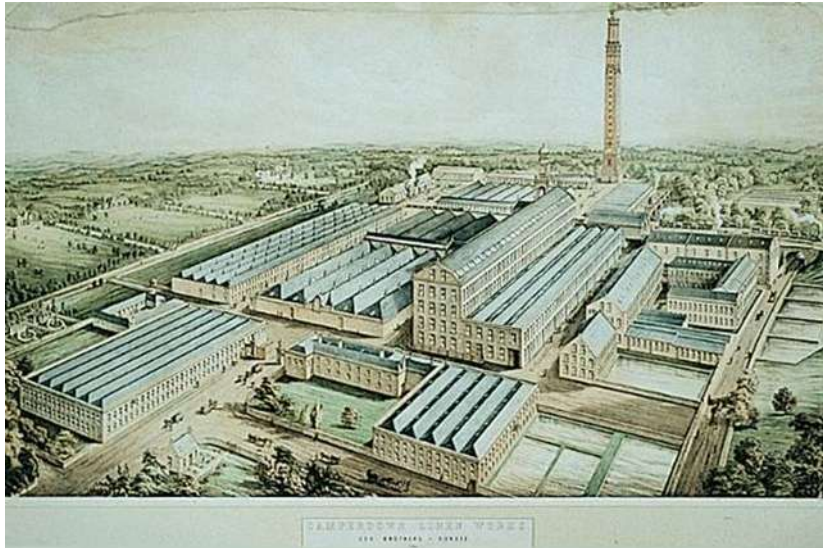
Camperdown Works, Methven Street, Lochee, NO3808 3168, NO33SE 64.00. (DW4)

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 branch railway in a 14.16ha (35-acre) site that employed 5000 people. Closed in 1981, it was pillaged for scrap but saved by a project to develop housing and a leisure park. The High Mill (1858-68) is of fireproof construction with ornate cast-iron roofs, a clock and bell-tower, and twin columns for a Carmichael beam engine. It has been converted into flats, as has a railway warehouse. Dominating Dundee is the 94m high **Cox's Stack**, a chimney that concentrated all the smoke from 32 boilers into an Italian campanile of 1865.

At the entrance from Methven Street, the 1863 calender for cloth finishing became a superstore, its Musgrave (Bolton) beam engine entablature carrying refrigeration plant, as an anchor to Lochee High Street shops. It set planning case law (TESCO vs City of Dundee) that the existence of an empty supermarket was not reason to refuse permission for rival (Asda) still larger ones nearby.

The Works Half-Time School (children under 15 worked alternate days, or morning or afternoon shifts), 1884, is now a Boys Brigade hall in Bright Street, NO 37894 31751. 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 due north in Clement Park, and his brothers to either side -unusually close to t'mill for jute barons.



Camperdown Linen Works in 1880. Left to right, houses of the three Cox Brothers, Calender, stables, C Range, Upper and Lower Factories (all for weaving), office in front, Foundry (with smoke) and Mechanics Shop beyond, High Mill (now Braehead), Dyeworks in front with cooling ponds, Batching/Low Mill/East Mill (1820s mill that preceded Co's), Boiler House, warehouses and branch railway that crosses Burnside Street on a skew arch. (Crown Copyright RCAHMS)

After Cox's, the bus takes a route back past sites in the DW section of the gazetteer, notably Logie Works in Brook Street, DW16.

Monday 12 August coaches start from Perth Road/ Airlie Place at 9.00, returning at 18.00. Each tour visits a working distillery. These are work places under the Factory Acts, without excessive alteration made to them for tourism. The rules are: *no open sandals, no high heels, no children under eight.* Under 18s may tour but should not expect a dram. Photography is forbidden.

Blairgowrie Printers, Reform Street, Blairgowrie. The business started in 1855 and moved to the

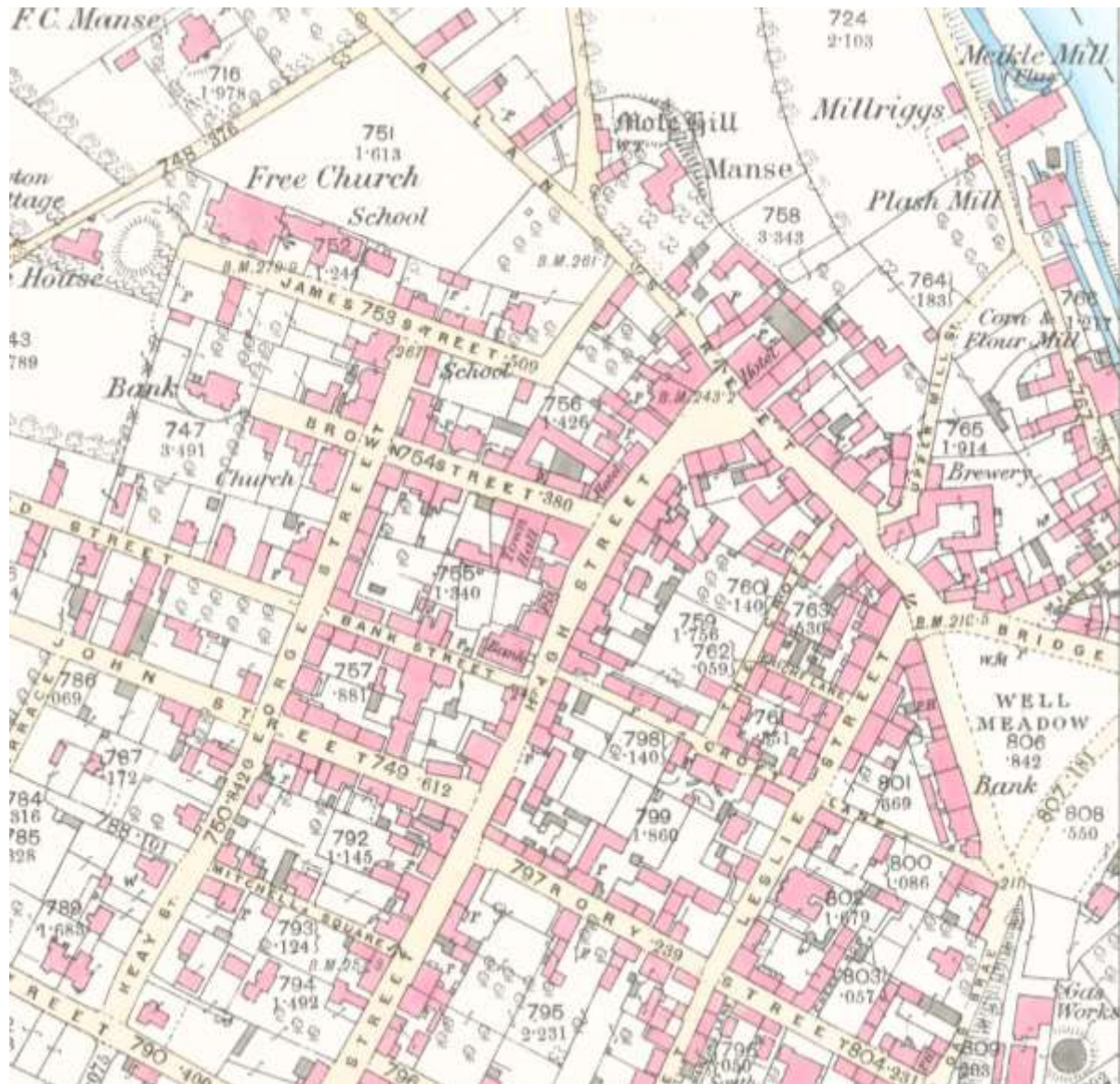


current premises in 1880. It produced the local paper *the Blairie*, or *Blairgowrie Advertiser* until 1978. A single-storey top lit building with galleries at each end and arched windows. The machinery inside, which with the building is listed, includes a Wharfedale and a Heidelberg press, and Intertype compositing machines, with hot metal casting. The owner, Hamilton Scott, served a seven year apprenticeship before becoming the main compositor, then buying the business in 1980. He and his late wife kept it running until 2005.

The Ericht Trust has examined the potential to open a museum *in situ*, ruled that out and now is developing a project with support from AHF to re-use an abandoned school, transferring into it the plant from that printing works and operating it there. As a first phase the Trust has filmed the machinery in operation and interviewed the owner, compositors and printers who worked there.

We have made special arrangement for each tour group to visit the Printers. The Trust ask that numbers visiting at one time be restricted. So *buses will drop 15-18 people at a time at the bus stop at Reform Street (Rory Street in map, p21), then move on one way anti-clockwise to park at Mill Street. After 30 minutes each group walks downhill, north on map, to Upper Mill Street, for coffee/tea in Cargill's Bistro, a former granary of the Corn and Flour Mill, with old photos and a*

structure of railway lines and pipes. Note sign to brewery opposite RBS, and interior of the Dome café, Leslie St/ Wellmeadow, any who have some free time in the afternoon.



1st Edition O.S. map, Blairgowrie in 1864, courtesy of National Library of Scotland. Here Reform Street is "Rory Street" in the lower part of the map, and the printing works is yet to be built in 1870 in the gap at number 797.

Flexible use of water, steam and oil for power. How did Blairgowrie's little mills compete with Dundee? Blairgowrie and Rattray contained 16 flax spinning mills and a corn mill. A mix of motive power enabled small mills at some remove from the main seat of the industry to survive against the odds. They are grouped in pairs on either side of the River Ericht as it steps down at natural falls that only needed a little channeling to give useful water power. Four water wheels survive, up to 24' diameter and 19' wide, each one larger than any *in situ* elsewhere in Scotland. Several diesel engines, two steam engines, and turbines exist at various mills in Blairgowrie and Rattray, put into action when water needed to be supplemented, the oil and coal used sparingly. The engines did not wear out as they would if in constant use. *The coaches will take turns to bring half of each group to one of the surviving steam engines while the other half of each group is at the printers'. The table will be honed on the day, but you must be in a position to leave after 30 minutes at each place.*

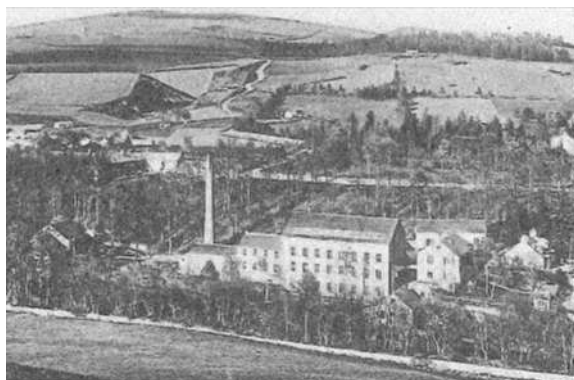
	G1	G2	H1	H2	P
10.00	Blairie Printers	.10 Keathbank Mill engine	Logierait Bridge		
10.30	Walk to Coffee, Cargill's bistro,	Oakbank wheel	Wade Bridge	Wade Bridge	Pitlochry hydro
		10.45 re-cross	Aberfeldy	Aberfeldy	

		bridge to top car park		and town	power station
11.00	Pick up at Keathbank top car park Pause above Westfield Mill berry fields (on bus)		11. Aberfeldy Distillery techy tour	11.30 Aberfeldy Distillery history tour	Blair Athol Distillery
12.00	Spittal of Glen Shee bridge; lunch		12 lunch then Dewar's museum	12.30 lunch Aberfeldy Distillery	Lunch
13.00	13.30 Royal Lochnagar Distillery (one group tastes before the tour, the other after its tour)		On bus		On bus 13.45 Blairie
14.00	14.30 Balmoral and Crathie bridges		14.00 Press Here Coupar Angus 40 mins		Printers 14.30 Tea,
15.00	15.15-15.45 pause in Braemar, tea bought for G2;		15. Blairie Printers; Cargill's bistro tea	15.10 Keathbank Mill engine 15.50 Blairie	Cargill's bistro 1500 go to Keathbank
16.00	16.40 Keathbank, if bus H still there, if not go on to Mill St	16.50 Blairie Printers, then stand at bus stop 17.15	16.15 Keathbank Mill engine 16.50 bus Keathbank to Mill St	Printers 16.20 walk to 16.30 tea, Cargill's bistro	on foot to Oakbank/ Ashbank 16.15 bus to Coupar Angus
17.00	17.10 collect Keathbank	17.20 collect Blairie	17.00 from Cargill's to Newtyle		1640 Press Here
	Rattray-Newtyle –Dundee		To Dundee		To Dundee

Keathbank Mill (NO177461, on E bank of River Ericht, Balmoral Rd, Rattray) was founded by Wm Fyfe in 1825 (low walls by bridge) and replaced in 1864 by a new mill parallel to the Ericht. A chimney is reduced from 100' to become a porch for one of the houses. Ornate cast iron roof trusses carried an outshot. The former owner's house and a warehouse are just to the east. The semi basement was a mechanics' shop. The mill spun flax, tow, jute and latterly rayon.

The mill retains at one end a single cylinder horizontal engine by J&C Carmichael, Dundee, 1865. Drive is by a spur wheel and bevel gears to a vertical shaft. Double-beat drop valves on the inlet and Corliss valves on the exhaust were added with a new 22" cylinder in c.1900. At the other end of the mill and lower down is a water wheel 6m (18ft) diameter and 3.7m (12ft 2in) wide, by John Kerr, Douglas Foundry, Dundee, 1865. This was coupled for electric generation in 1948 to two diesel engines, one of which recently went to a collector in Wales. These were displayed to the public in the 1990s but the visitor attraction has closed and the mill was converted to flats in 2004-8. The engine is accessible only by prior arrangement: phone number on door below steel stair.

(fig Keathbank Mill, Watson postcard collection)



Ref, Geoff Hayes in *Old Glory* No 61 March 1995



Water-powered flax mills in Blairgowrie (west bank) and Rattray (east). 1st Edition O.S., 1864. A new mill is about to built at Keithbank Mill at right angles to the old, bottom right. Oakbank Mill is the flax mill opposite, Bramblebank and Ashbank are the corresponding pair to their north, with related company housing. Lornty and Brooklinn Mills are at the left.

Blairgowrie spinning mills East –West	Rattray spinning mills, East –West
Lornty Mill 1814-1904	Craig 1834- 1880s
Brooklinn Mill 1845-1918	Westfield Mill 1836- fires 1901 and 1934
Ashbank Mill 1836, fire 1880s, resumed 1902, closed 1918	Bramblebank 1833-1903, resumed 1940s
Oakbank c. 1822, fire 1872, closed 1930	Keathbank c1825, 1864, closed 1928-32, restarted 1940s- c1980, visitor centre 1992-2000, flats
Ericht Linen Works (in fact jute, steam-powered)1867-1902	Erichtside Works 1798- 1905 scutching 1940-46, canning, paper
Meikle Mill 1798-1902 (Corn Mill)	Ashgrove Works 1866-silent 1925-35, and finally c.1980
	East Mill 1810- c.1876
	West Mill, 1845 –c.1907

Oakbank Mill, (NO 17689 46204), across a footbridge, was built for James Grimond in the 1820s and used for his experiments with jute from India in 1832. The mill was rebuilt after a fire in 1872. There is a low breast waterwheel 6m diameter by 3.2 m wide, coupled by bevel gears to a vertical external drive shaft that is now unique in Scotland. Repairs in around 2006 have come to a halt. The weir upstream was being refurbished for hydro power generation by Archimedean screw when it had an unfortunate breach in 2010, and that project is in abeyance. Also seen from the footbridge is **Bramblebank Mill**, built for James Rattray by 1825 (stated by some to be 1833, but already in Directories), extended c1863, with a large wooden wheel house (NO 1727 4669, NO14NE 104), Bramblebank House and the chimney of Westfield Mill.

When reorganised by Thomas Thomson in 1948-50, the three mills of the company were allocated to respectively spin flax (Bramblebank), rayon (Keathbank) and jute (Ashgrove) by water, steam, gas and diesel power. Bramblebank took electricity from the waterwheel, gas and diesel engine at Westfield Mill just to the north. That mill is a roofless shell, after fires in 1901 and 1934, but warehouses, a waterwheel, casing of a turbine and the port diesel engine of the submarine HMS *Una* (1940) survive, vandalised. Ashgrove Mill has a 22ft diameter 17ft wide wheel (Thomson Bros, 1871), a Pearce Bros horizontal steam engine, Lancashire boiler, three diesel engines and line shafts.

Today Thomson's focus on growing soft fruit in the fields around their mills.

By coach to jute mills, bridges and whisky, with Mark Watson, HS and SIHS

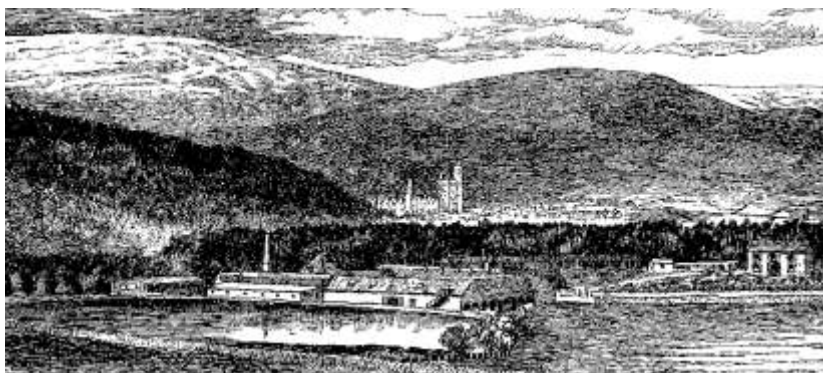
The bridges at Spittal of Glenshee (NO 10896 70109), Clunie Water (NO 14778 86466) and Invercauld (NO 18629 90942) were built under the supervision of Major William Caulfeild. Inspector of Roads from 1732 until his death in 1767, he succeeded General George Wade in supervision of the military road building programme in 1740. The bridges carry the military road that ran from Blairgowrie to Braemar (constructed 1748-50) and to Fort George, Ardersier, intermittently to 1756.

Spittal of Glenshee bridge was built in 1749 at the modest price of £40 and carried the road over the Shee Water. As with many Caulfeild military bridges, it is of rubble masonry construction and has a distinctive sloping carriageway and parapet which rise to a peak above the crown of the main span. The single arch is comprised of flat and irregularly shaped stones. Lime mortar and pinnings would have been used throughout and a lime harling would have been applied to act as a protective coating. The bridge is still in use as a road bridge, with an extra parapet for safety.

Clunie Water Bridge shares some features with the bridge at Invercauld (rubble construction; irregularly sized segmental arches; large, solidly build cutwaters) and so is usually given a construction date of 1752 (bridge building usually lagged behind road construction so a date later than that of the road would not be unusual). However, the rise of the carriage way is less pronounced than that usually associated with military bridges of this period and the parapet has a more rounded profile, similar to that of parliamentary bridges built in the early 19th century. It is possible that the arches and pier are of early date with later repairs and alterations.

The six arches at the Bridge at Invercauld are of irregular spans varying from 3m to 21m and increase in size to the centre. Again, the carriageway and parapet rise steeply to a peak at the span of the main arch. The irregular spans, both at this bridge and the Clunie Water bridge, were most likely dictated by the need to obtain suitably solid foundations for the piers. Each pier is protected by a massive triangular cutwater topped with large flags. The bridge, built in 1752, remained in use until it was superseded in 1859 by a new bridge which carries the present A93 and routes traffic away from Balmoral Estate. Historic Scotland looks after this bridge.

(Lindsay Farquharson, Wade Bridges Project at PKHT, now Historic Scotland)



Royal Lochnagar Distillery (DCL/ Diageo) was built here in 1845 after an earlier one was burned down in 1841 by unlicensed rivals. A Royal Warrant of Appointment was granted in 1848.

Fig. left, Alfred Barnard *Whisky Distilleries of the United Kingdom* (1987), photo below, Watson, 1994

Nosing: “sherry, fruit, nuts spice and a whiff of smoke” (Smith and Wallace, *Discovering Scotland’s Distilleries*, 2010). Technical points: open mash tun with rakes, wooden wash backs, and two small stills each with a cast iron worm tub, retaining earlier idiosyncrasies when it was re-equipped in



1963/1967. The maltings and pyramidal kiln with tall square ventilator still stand. A large square chimney exists, although all machinery had been turned by water, not steam in 1886/7 (said Barnard). The visitor centre is within a range of cart arches, some for the farm attached to the distillery. A large reservoir gathers spring water.

Crathie Bridge, by John Justice Junior of Dundee: 1834 suspension bridge, 137-foot span. This seems to be a further evolution of the stay bridges at Loups, Kirkton of Glen Isla (1824) and Haughs of Drimmie. The bridge had work done to it by Blaikie Brothers of Aberdeen in the 1880s, but there are still elements like the below deck bracing characteristic of other Justice bridges, and Linlathen East Bridge. Note the backwards '4', not reversed in the sand mould of the foundry.

Balmoral Bridge: A plate girder bridge in front of Balmoral Castle by IK Brunel, 1857, his only Scottish work, iron supplied by Brotherhood of Chippenham. In fact its erection was supervised by the estate factor. Victoria thought it too utilitarian but some design was put into the lozenge-pattern cut outs and the curve of the top rail. An interpretive plaque presents RCAHMS drawings, and there also is a plaque placed there by ICE PHEW.

In a pony truss bridge most of the interest in its structure is at deck level and above. From beneath, you only see timber baulks, coming up for periodic renewal or replacement in concrete. The rocks are slippery when wet so best to appreciate from above. Beware of traffic.

Ref Hay and Stell, *Monuments of Industry* (1986)

The other element of interest in Balmoral is the joiner's shop, acquired in the Great Exhibition of 1851 and sent by rail to the Highlands by Eagle Foundry, Manchester, for use as a temporary ballroom. It is one of the oldest extant corrugated iron buildings. (*Not accessible in August when the Queen is in residence*).

Monday 12 tour H Highland Perthshire O.S. Landranger 51, 52, 53

With Linda Ross, Scottish Maritime Museum and Lindsay Farquharson, HS

Logierait Bridge is one of three lattice girder bridges in Perthshire by Joseph Mitchell. Its two 137ft span girders were made by Fairbairn of Manchester. Iron clustered column portals bear the note that it was last painted in 1930. This was preserved in the refurbishment of the bridge in 2002, achieved by a local group as the rail bridge is now a non-adopted single-track road. (*fig, Eric Watt SIHS collection, 1974, before refurbishment*)



Tay Bridge, Aberfeldy, 1733, (NN 85134 49298) was built under the supervision of General George Wade and carried the Crieff to Dalnacardoch military road over the River Tay. However, unlike the majority of the bridges in the military road network which were modest and utilitarian, the monumentality, expense and grandeur of the Tay Bridge suggest that it was meant more as a memorial to General Wade's work in Scotland and a symbol of Hanoverian might. The bridge was designed by William Adam, one of Scotland's foremost architects at the time at a cost of £4095 5s 10d (to give some comparison, a modest masonry single arch bridge would generally cost in the region of £40). Master masons and other craftsmen such as carpenters were brought from the north counties of England as Wade believed them to be more accustomed to works of such a monumental nature. Mounted on the keystone of the middle arch is a marble panel bearing the monarchic

symbol of a crown, sceptre, sword and cannon detail. The remains of marble plaques (conserved, along with the crown and sceptre, in 2005 by Graciela Ainsworth) on the upstream elevation bear inscriptions in Latin and English stating that, '...At the command of His Majesty King George II this bridge was erected in the year 1733. This with the road and other military works for securing a safe and easy communication between the Highlands and trading towns in the low country was....committed to the care of Lieutenant General George Wade...who laid the first stone of the bridge on the 23rd of April and finished the work in the same year'. Wade considered the Tay Bridge his greatest achievement of the road building programme, formally opening the bridge on 8th August 1735. The bridge remains in use today.

(Lindsay Farquharson, Wade Bridges Project at PKHT, now Historic Scotland)

10.45 Group H1 goes straight to the Distillery, has an hour's tour then lunch at 12.00, followed by 30 minutes in the museum display about John Dewar's. Due to limited capacity in the distillery and its café, **Group H2** walks 30 minutes in Aberfeldy from the public w.c. at Taybridge Terrace, noting:

1. Glen Lyon Tweed Mill, 2-storey, M-roofed, still in operation. A traction engine is nearby. At a greater distance across a golf course, is the world's first plastic bridge, by Bill Harvey and students of Dundee University, 1986. Kevlar cable stays between fibre reinforced polymer A frames and deck.

2. Aberfeldy Corn Mill, built in 1826 in 'Breadalbane Estate gothic' with a 6.1 m overshot wheel. Reborn from failing visitor attraction as UK Independent bookshop of the year, with art gallery and almost all machinery still in place.

3. Birks Cinema, 1939, re-opened in 2013 as a community venture, where the group H2 boards the bus waiting in the Square at 11.20 to form the second distillery tour at 11.30. Lunch at 12.30, omit the museum, and leave with group 1 at 13.00.

4. Keen eyes on the bus might spot in passing a Victorian laundry, still in use, a joiners shop and a gasworks with a stone chimney, also in Breadalbane estate gothic.

Aberfeldy Distillery was built in 1898 by John Dewar and Sons Ltd, to go into the White Label blend, connected by rail to warehouses in Perth. Dewar's merged with DCL in 1925 but the Dewar brand, stocks and four distilleries were sold to Bacardi in 1998. Sited where there had been Pitilie distillery from 1825-1867, this is a model Charles Doig design similar to those of that era in Speyside, parallel to a railway, topped by a pagoda kiln and chimney. Rebuilt in 1972-3, with show window for four stills. The maltings had a dark grains plant fitted in 1975, and a state of the art visitor centre from 2000. Your guides at Aberfeldy Distillery offer two distinctive tours. Donald Kerr has a long history at Aberfeldy distillery, his father working there while he was growing up, and will take a historical tour for the group. George Dark has developed a technological tour which he will trial on AIA.

Nosing: "honey and spice, sweet, malty, nutty and fruity" (Smith and Wallace, *Discovering Scotland's Distilleries*, 2010).

Press Here/ Quarto Press, Beech Hill House, Beech Hill Road, Coupar Angus PH13 9AZ. Tel 01828 628001 or 07908 023901. From Blairgowrie, come up hill into Coupar Angus past the 30mph limit signs, take first right (signpost 'Cemetery'), then next right in 100yds. Short walk uphill.

Purpose-built workshops house a remarkable collection of printing and type casting machines and typefaces that are actively demonstrated by John Easson to keep printing traditions alive.

Tour P Pitlochry Power Station and Printing Presses

P/I

With Russel Coleman, Headland Archaeology and SIHS

On the straight dual carriageway heading towards Pitlochry look left for the farm steading with a circular horse mill. The conical roof is being reslated over renewed wooden sarking, a remarkable example of modern carpentry skills.

Blair Athol Distillery, Pitlochry (Bell's/ Diageo). Beside the A94, south side of town. Established in 1798 in Pitlochry (and not in Blair Atholl, seven miles further north), Blair Athol Distillery claims to be one of the oldest working distilleries in Scotland. But in fact it was not then able to compete as it was paying high excise dues unlike anyone else, so it closed and restarted in 1826. Closed in the 1930s it re-opened under Arthur Bell & Sons after a rebuild in 1949. "The signature malt of the Bell's blend, Blair Athol is rich, spiced and nutty, a bit like ginger cake" (source, Bell's website). Buildings with clerestorey ventilators, and trees round about, are blackened by an algae that is attracted to maturing whisky fumes. Dark grains plant to treat the residue, 1975. The distillery expanded in 1973 and in 1982 so that there are 4 stainless steel washbacks beside four larch ones.

Pitlochry Power Station was a showpiece for the Scottish Hydro-Electric board so it had special attention to its design paid by H.O. Tarbolton architect with Sir Alexander Gibb and Partners, engineers, 1947-1951. It incorporates the dam that created Loch Faskally, a twin arched bridge over two tilting drum gates by Glenfield and Kennedy, Kilmarnock, and a fish ladder. Neart nan Gleann = Power from the Glens. It generates 15MW from water already used five times, using two Kaplan turbines with variable pitch blades below two 7500 kW turbo alternators. The blades of a Francis turbine stand in front of the main door, and there too is a plaque to engineer E MacColl.

Also reachable from the car park is a wire cable suspension bridge between lattice pylons, 1913, at Port-na-Craig. The Festival Theatre was completed in 1981 by Law & Dunbar Naismith.

Quarto Press/ Press Here: see tour H, above.

Tuesday 13 August coaches start from Perth Road/ Airlie Place at 9.00, returning at 22.00

Tour I: Finzean, Echt, Montrose OS Landranger 38, 44, 45

With Mark Watson, Historic Scotland and Scottish Industrial Heritage Society

Fettercairn Distillery, licensed in 1824 as soon as it was possible to come down from hiding in Cairn o' Mount. From 1830-1926 the distillery was owned by John Gladstone, Fasque Estate, father of PM William Ewart Gladstone. A gothic arch recalls an incognito visit by Victoria and Albert, before he was her least favorite prime minister. Rebuilt after a fire in 1883, enlarged by a second pair of stills in the 1960s, owned since 1983 by Whyte and MacKay/ United Breweries. Nosing: "Malty, nutty and spicy, with notes of vanilla and honey" (Smith and Wallace, *Discovering Scotland's Distilleries* 2010). The necks of the four stills are cooled by running water, and the cooler was made by the Aluminium Plant and Vessel Company, London, in 1938. No time for a full tour.



A woodworking mill with a 13'6" start and awe wheel, making wooden buckets, is the only one of its kind to survive in Scotland. A mile away are Forest Row Saw Mill with a 14'6" wheel, a turning mill with a 9'8" wheel, and a diesel generator, with wooden launders fed from a single weir. On the north side of the road is a single-ring waterwheel frame leaning on a wall. Open by appointment: Birse Community Trust 01330 850200 <http://www.birsecommunitytrust.org.uk/Watermills/watermills.html>

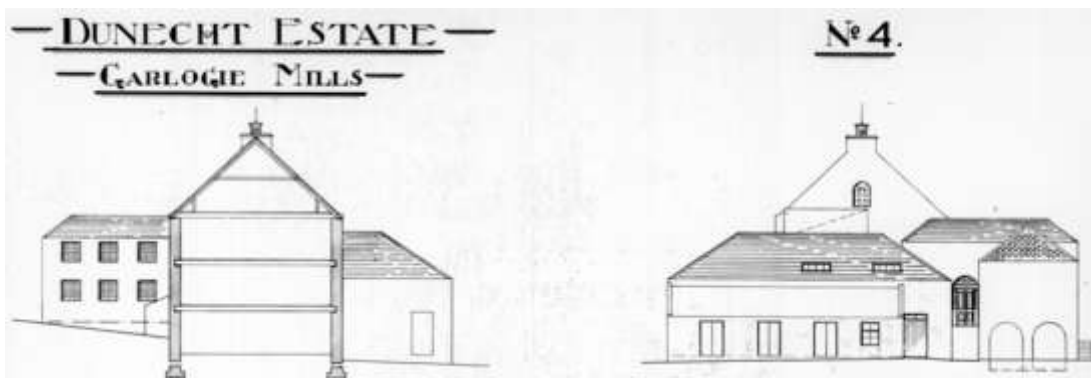
Your Task: draft a statement of significance. "It would be very helpful to BCT in its struggle to ensure the survival of the mills, for it to be able to cite their wider significance more clearly. We would be grateful for help with establishing the rarity and wider significance the Finzean Wood Mills."

Finzean bucket mill, built c.1853 by Peter Brown, is probably unique in Britain with its specialised water powered machinery for producing wooden pails or buckets. The mill is a single-storey and attic wood, stone and brick building with a corrugated-iron roof, and adjoining sawmill. It has a mid-breast paddle wheel with double cast iron frame. A small, single-storey, rectangular plan kiln lies to the N of the bucket mill, with boarded timber gables, and a boarded timber ramp to the S leading to the door. There is a cast-iron fire box access below the ramp, and a brick gablehead stack to the N with a circular can. Inside, the fire box runs the length of the kiln, surmounted by a slatted floor. To the NW of the bucket mill is the cart house, stable and cottage. The mill was worked by three generations of Browns until 1974. Stan Moyes, took over the operation of the Mill in the 1970s. An appeal was launched in 1982 to restore the mill. It was fully restored, owned and operated by Birse Community Trust since 1999, when a former Finzean Water Mills Trust was wound up. It periodically produced small batches of buckets as part of conserving the operation of the mill. They were made from staves of native Scots pine timber cut from trees selectively felled by Birse Community Trust.

Finzean sawmill and turning mill form a group of single storey wooden buildings with two low breast wood and iron paddle wheels and the site for a third. Now they are worked by the fourth generation of Duncans, there since 1850. The sawmill, built in the 1820s and restored in 1999, is on the W side of the site, and is a rectangular plan mill with boarded timber walkway oversailing the entrance to the basement. The sawmill continues today to cut locally-grown timber. It supplied local oak cut at the mill for flooring in the Scottish Parliament.

Turning mill, built in the 1830s, traditionally produced a variety of turned items, including herring barrel bungs and brush heads, but now mainly focuses on small domestic utensils such as spurtles and rolling pins. It comprises a single-storey and attic, rectangular plan mill, complete with double cast-iron frame start and awe wheel set in a granite wall to the S elevation; a square-plan steam-operated kiln (formerly wood fired); a timber lean-to smiddy with pulleys, belt-driven metal lathes and bellows for the forge still in place (restored in 1999); a single-storey generator house; and various ancillary sheds.

The lade, weir and sluice gate have been rebuilt in timber and concrete, flowing from W to E off Water of Feugh, and at the weir to the S of mill buildings, the flow is controlled by a sluice gate. The N lade drives the sawmill wheel, while the S lade is divided horizontally into lower and upper lades; the upper lade drives a small central generator wheel, discharging into tail-race of the sawmill wheel; the lower lade discharges into the tail-race of the sawmill and generator wheels to drive the turning mill wheel. (from text by Claire Herbert, Aberdeenshire Council Archaeology Service)

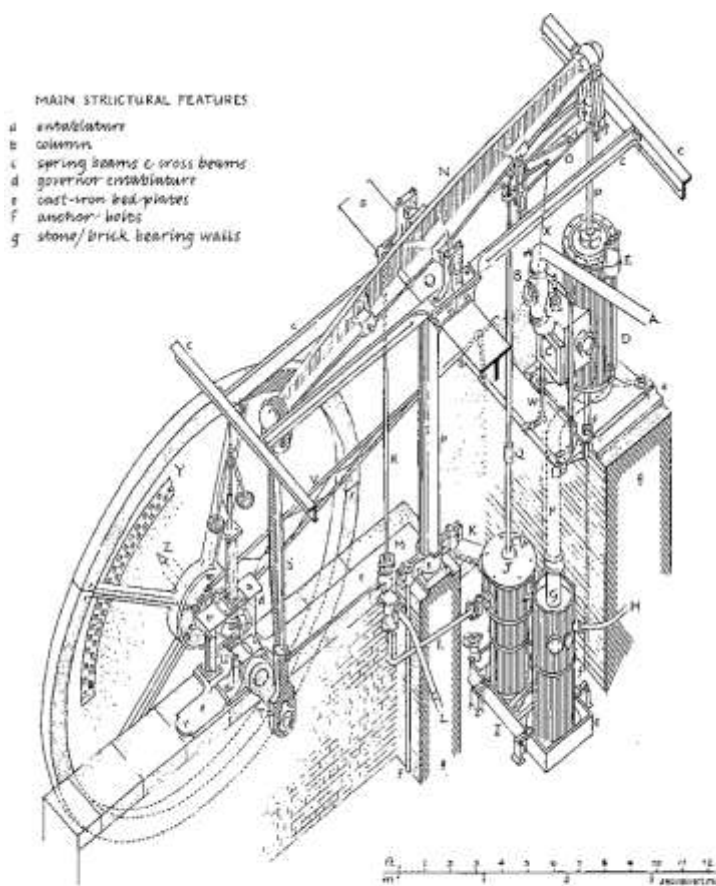


Garlogie Beam Engine, rear of Garlogie village hall, B9119 10 miles W of Aberdeen. NJ782054. Believed to have been built between 1830 and 1840, this is the only rotative beam engine remaining in situ in Scotland. It drove Hadden's wool spinning mill until 1904. The mill itself was demolished in 1934 but, miraculously, the engine house and its engine survived. Despite being abandoned for 80 years it is remarkably complete and in substantially original condition, having escaped the McNaught compounding process applied to many single cylinder engines of this period. Adjoining hydro-electric plant built in 1923 to supply power to the Dunecht Estate. This consists of a horizontal-shaft Francis

turbine by Escher Wyss of Zurich, coupled to an English Electric Company generator. Outside is an earlier vertical shaft turbine pit, a surge shaft in a mound, and at some remove, a dam and company housing. Refurbished and opened to the public in 1992, but the site is no longer managed by Aberdeenshire Council Museums Service.

Fig, left, Hay, G and Stell, G, Monuments of Industry (RCAHMS, 1984)

below, @Dunecht Estate/ ACAS showing gas, turbine and engine house, counting house, workshops and lodge



- MAIN STRUCTURAL FEATURES**
- a entablature
 - b column
 - c spring beams & cross beams
 - d governor entablature
 - e cast-iron bed-plates
 - f anchor bolts
 - g stone/brick bearing walls

PRINCIPAL WORKING COMPONENTS

- | | | |
|----------------------|------------------------------|-----------------------------------|
| A main steam pipe | J air pump | S connecting rod |
| B steam valve * | K air pump waste discharge | T crank |
| C water chest | L returns hot-feed to boiler | U crank shaft & eccentric |
| D cylinder | M boiler feed pump | V eccentric rod |
| E relief valve | N beam or great lever | W slide valve linkage |
| F steam exhaust * | O parallel motion | X governor/throttle valve linkage |
| G condenser | P piston rod | Y fly wheel & barring-rack |
| H cold water feed | Q air pump rod | Z to outboard bearing |
| I non-return valve * | R feed pump rod | |
- * denotes missing or incomplete



For Broadford Works and Montrose see J below.



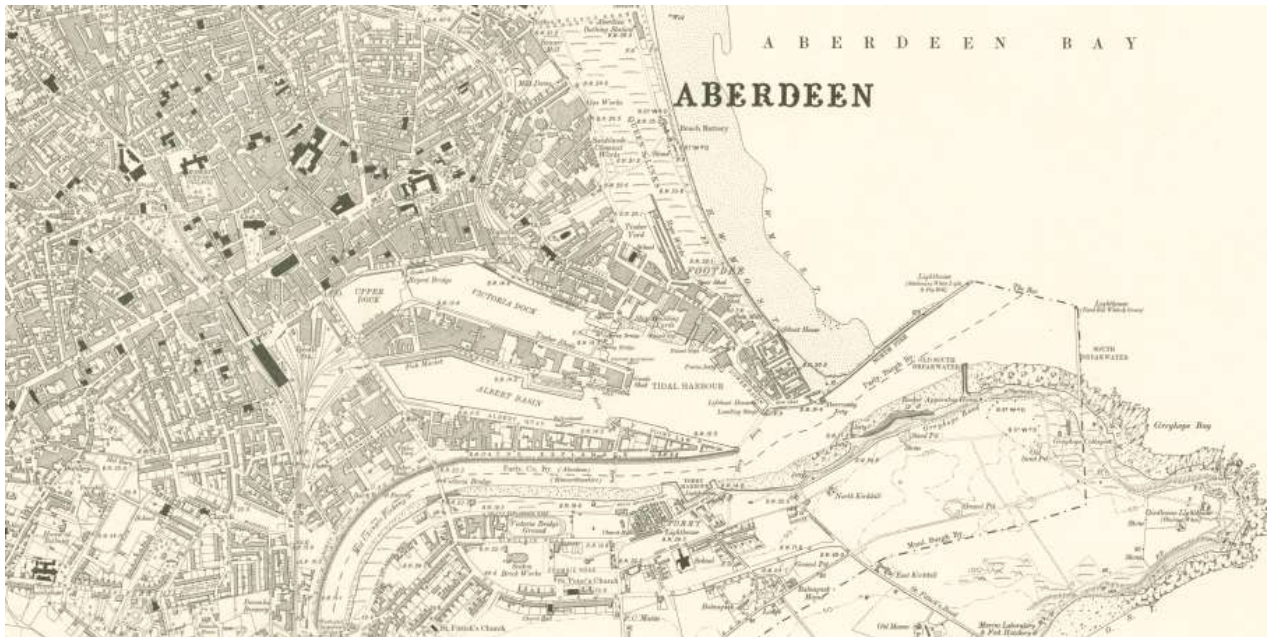
Tour J Aberdeen and Montrose

With Peter Heald, Ellie Swinbank, National Mining Museum Scotland.

Leigh Johnston, Historic Scotland, Audrey Daken, SHBT, Meredith Greiling and Jenny Brown Aberdeen Maritime Museum, give local expertise.

Rest stop is on the A90 near Marykirk which bears the slogan “Ye may gang far and fare waur”. Purchases are at own expense and risk.

Bridge of Dee NJ 9290 0356, built 1520-27 and carefully widened on its west side by John Smith in 1842. Seven ribbed arches on 45’ spans, four more added and the outer rib moved to the outer edge. The cutwaters double as pedestrian refuges. (*We pass this on left without stopping*).



O.S. 6” map, surveyed 1899-1900, published 1902 (courtesy of National Library of Scotland)

Aberdeen Harbour was improved by John Smeaton (1770 North Pier, lengthened 1810 and 1868 NJ 96250 05990) and Thomas Telford (Old South Breakwater, 1810, 800 feet). Victoria Dock (centred NJ 94900 06050) was formed as a gated Wet Dock in 1848: 23 acres and a further 7 acres separated by Regent Bridge. This and dock gates were removed in 1975 so now the harbour is tidal. South Breakwater was added in mass concrete in 1873. Albert Basin (centred NJ 94890 05740) was formed by the diversion of the River Dee in 1869-1878 and Commercial Quay was formed there for the fishing fleet and a fish market. This is the departure point for harbour cruises. At Torrie harbour is another basin for fishing boats, River Dee Dock, 1909-1915, and two cast-iron leading lights mark the navigation channel. 1842. Kipper smoking kilns are found in the area east of the railway line around Poynerook Road, and Ross’s smoke house handles salmon at Sinclair Road, Torry.

There were two patent slips for the Hall Russell and Duthie yards, one dry dock (no longer extant), and a floating pontoon dock at Pocrá Quay. Hall Russell and Co was the last of Aberdeen's big shipbuilders, until 1993. NJ 95400 06000, NJ90NE 11. The launching slips are hard to trace, and a patent slip cradle has been transferred to the Scottish Maritime Museum at Irvine, Ayrshire.

Fittie comprises two squares of Fishermen’s houses near the harbour entrance, huddled against the sea, with a picturesque assortment of sheds, outhouses and water pumps inside the squares.



(Fig. above, Aberdeen City Handbook, 1951. Dotted line outlines Harbour Board Property)

Torry on the south side of the Dee was once a royal burgh in its own right and became part of the city of Aberdeen in 1891 after the construction of the Victoria Bridge. Today, the harbour is dominated by oil but in the 18th and 19th centuries, fishing was the main industry. The arrival of steam-powered trawlers in the late 1800s caused Torry to become a centre of fish processing, shipbuilding and repair and the population burgeoned. 19th century Torry was also home to numerous brick and tile works, a saw mill and a tram depot. Remains of many of these can be seen today, with additions like the Marine Laboratory. *(Coach J follows coastline on way out of Aberdeen)*

Ref Chris Croly, *Torry Industrial and Maritime Trail* (Aberdeen City Council)

Aberdeen Iron Works NJ 95220 06150. A complete block bounded by Wellington St (Moulding Shop) St Clement St (Turning Shop), York Place (Blacksmiths' Shop) and York St (Fitting / Boiler shops). The upper floors and walls facing a central courtyard were reformed as steel-framed shops for travelling cranes belonging to Hall Russell and Co, but the older layout is readable in the external granite walls.

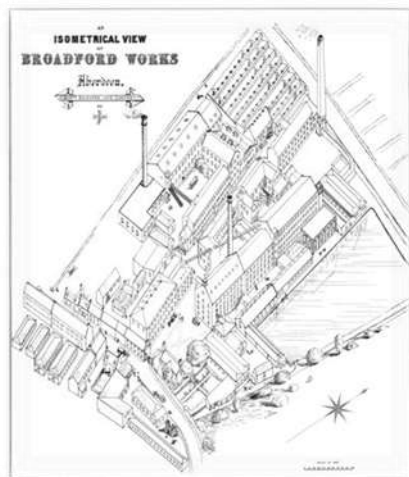
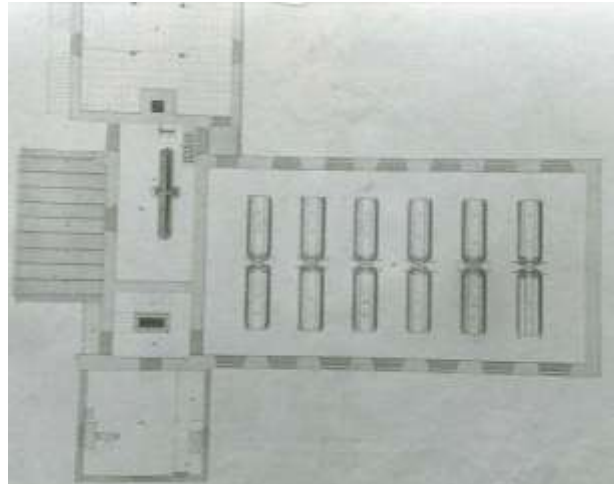
Rubislaw Quarry is an alternative to the Harbour tour for people wearing boots and with both hands free. Access to the quarry requires permission to enter private land from the new owners, which we have obtained. It involves some scrambling over rough ground to access a pontoon via a climbing net and a rope that requires use of both hands. People uncertain of their agility are advised to take the harbour tour instead, but there is not room on the boat for the entire busload so we have booked 27 places there, and ten or more can go to the quarry. In case of an incident, or for toilets, we will use the Gordon Highlanders' Museum, tel 01224 311200.

Rubislaw Quarry: when it closed in 1971, it was some 450 feet deep and had been worked for over 200 hundred years. Hundreds of thousands of tons of grey granite had been blasted and cut from the ground. It has been estimated that at least 50% of Aberdeen's buildings are built of Rubislaw stone. Rubislaw also provided stone for Portsmouth and Southampton docks. However, the depth of the hole, the need to continually pump the quarry floor clear of water, poor stone and competition led to the quarry's closure. The hole remains spectacular despite filling with water.

Ref Granite Trail Aberdeen and <http://www.rubislawquarry.co.uk/now/>

Aberdeen Maritime Museum, Ship Row, presents the history of the harbour, shipping, ship-building and North Sea Oil. The buildings are 16thC. Provost Ross's House, linked to Trinity Congregational Church, 1877, by a glazed curtain wall in 1992-7, perfect for displaying a large scale model of an oil rig and other large maritime items.

Broadford Linen Works, Maberly Street, Aberdeen. NJ936068. Founded in 1808, this city within-a-city contains the oldest surviving iron-framed mill in Scotland. Built for Scott Brown & Co of Dundee, it was acquired by London financier John Maberly in 1811. He passed it to Richards and Co in 1830, fled his debts and set up linen factories in France. For most of the 19th century this was one of the few Scottish firms controlled from England. The engineers who built it, engine and machinery in 1808 were Fenton, Murray & Wood of Round Foundry, Leeds, so there is a direct link to John Marshall and his mills in Leeds and Shrewsbury. Gas lighting was fitted by Boulton and Watt in 1814. The old Grey Mill was enlarged to the south c.1816-1820, with a bellcote, and to the north in 1864. Power loom weaving began in 1824, (long narrow three-storey building to the north west) and there are a number of associated buildings for warping, hackling and hose-pipe-making. In 1864 this was the biggest linen works in Scotland if measured in terms of horse power, rather than workforce, spindles or

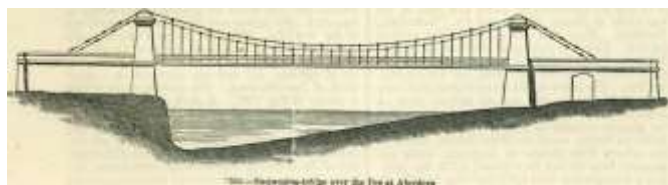


looms (that would then be

Baxter's of Dundee). The complex is dominated by a brick-built spinning mill of 1914 (built by Belfast contractors McLaughlin and Harvey) and reinforced concrete floored additions of 1912, one of which, known as the 'Bastille', is a raw flax warehouse converted into flats by Mark Wilson in 1995, the other built for weaving along Ann Street. Note also the square chimney, 1864, a round-section dust flue and a concrete tower for fire hoses. The mill is proposed to be developed as an urban village with input by the Prince's Regeneration Trust and Scottish Historic Buildings Trust.⁵

Take care: buildings are heavily vandalized. Stick to recommended route. Do not assume that hand rails are secure at stairwells. Watch your step for broken glass and nails. Wear boots. If you prefer, view from the three perimeter streets, look for a sewer ventilator in Hutcheon Street, return to Maberly St entrance and board bus within 35 minutes.

Wellington Suspension Bridge, NJ 9432 049. Designed by Captain Samuel Brown and built 1829-31. The granite pylons are 217 feet apart. Some reconstruction in 1930 (of the deck beams) and 1984.



Further refurbishment took place about 8 years ago, particularly focused on the chains that pass

⁵ Fig top, Broadford Works, 1st floor plan of spinning frames, drying floor over boilers and engine c1811. Source, Richards Archives. Middle, isometric, 1864, source Aberdeen City Museums.

over the pylons, one above the other, of triple eye-bar links. Brown also built Union Bridge, Berwickshire, and Montrose Bridge, Angus, pictured below.

Ref: Paxton R, Shipway J, *Civil Engineering Heritage Scotland*, 2007, 98-9.

Girdle Ness Lighthouse (Northern Lighthouse Board)

Built in 1833, it was one of about twenty lighthouses designed by Robert Stevenson, engineer to the Commissioners of the Northern Lighthouses. Stevenson was the grandfather of author Robert Louis Stevenson. It was built by Aberdeen contractor James Gibb, the same tower showed two distinct lights, one above the other, both fixed. The lower light consisted of 13 lamps and reflectors arranged like a garland in a glazed gallery built round the outside of the tower about one third of the way up. The main light was altered to a moving one in 1847, the old lantern transferred to Inchkeith and the lower light was discontinued in 1890.⁶



Before electrification, incandescent brightness was attained by pressure-vaporised paraffin. The lamp and 2 large concave reflectors were activated through an arc covering the entire seafront by a clockwork motor and imbedded in a mercury bath to pressure an even bearing. It sent its 200,000 candlepower beams 25 miles out to sea on a good night. The fog horn was put into operation when visibility fell below 5 miles, and was discontinued in 1987. The Light was automated in 1991 and the keepers' cottages were then sold.

Girdle Ness is one of a network of twelve ground-based reference stations providing Differential Global Positioning System (DGPS) transmissions around the coasts of the United Kingdom and the Republic of Ireland. DGPS transmissions were introduced in 1998 as a satellite-based navigation system. It is the newest element in the mix of visual, audible and electronic aids to navigation provided by the three General Lighthouse Authorities of the UK and the Republic of Ireland under their Marine Navigation Plan. It is available to all mariners and is financed from light dues charged on commercial shipping and other income paid into the General Lighthouse Fund. The other Scottish Stations are Butt of Lewis in the Outer Hebrides and Sumburgh Head in Shetland.

The light and DGPS is monitored 24 hours from the Northern Lighthouse Board HQ in Edinburgh. This checks the operation of over 70 lighthouses around Scotland and the Isle of Man.

<http://www.nlb.org.uk/LighthouseLibrary/Lighthouse/Girdle-Ness/>

Coastal route south of Stonehaven:

I/J

Inverbervie flax mills and bridges. NO 8319 7290. The first flax spinning mill in Scotland, using Kendrew and Porthouse' (Darlington) patent, started here in 1787. Several small mills and their warehouses dot the haugh, the valley below the town. **Inverbervie Old Bridge** was built 1797 by James Burn: 102' span and 80' high with vaulted embankments. New reinforced concrete 7-span Jubilee bridge opened in 1935. Scale replica of Cutty Sark figurehead celebrates her designer, Hercules Linton, born here.

Gourdon harbour NO 8257 7062. Thomas Telford built a central pier in 1819. This was enclosed by the west harbour in 1842 and the Gutty Harbour in 1859. Outer breakwaters were added in 1959

⁶ Fig is from a Bank of Scotland advert in *Aberdeen Official Handbook 1951*

and 1970. Kipper houses and warehouses stand on the piers, and a leading light is on the road down the hill. The 1890 *Maggie Law* lifeboat is displayed in the Lifeboat House.

Ref Paxton R, Shipway J, *Civil Engineering Heritage Scotland*, 2007, p69; Telford Atlas

Benholm meal mill NO 806 691, Johnshaven. Small grain mill with a modified kiln and new wheel, restored to working order in 1987-1995. Open to the public (01561 361969) as a tea room giving training in catering and horticulture. Bus stops in the top car park, allowing people to walk down to the mill by the pedestrian route. A reinforced concrete bush-hammered bridge, by FA MacDonald and partners, 1932, 103 ft span with castellated details may be seen from the old bridge depending on the state of the overgrowth. *The tearoom will stay open for us, accommodating half of the group at a time, so the other half will see the mill. (£1.20 for a cup of tea and £1.50 for coffee –If you want this please pay for it yourself).*

Montrose, Angus (gazetteer AN)

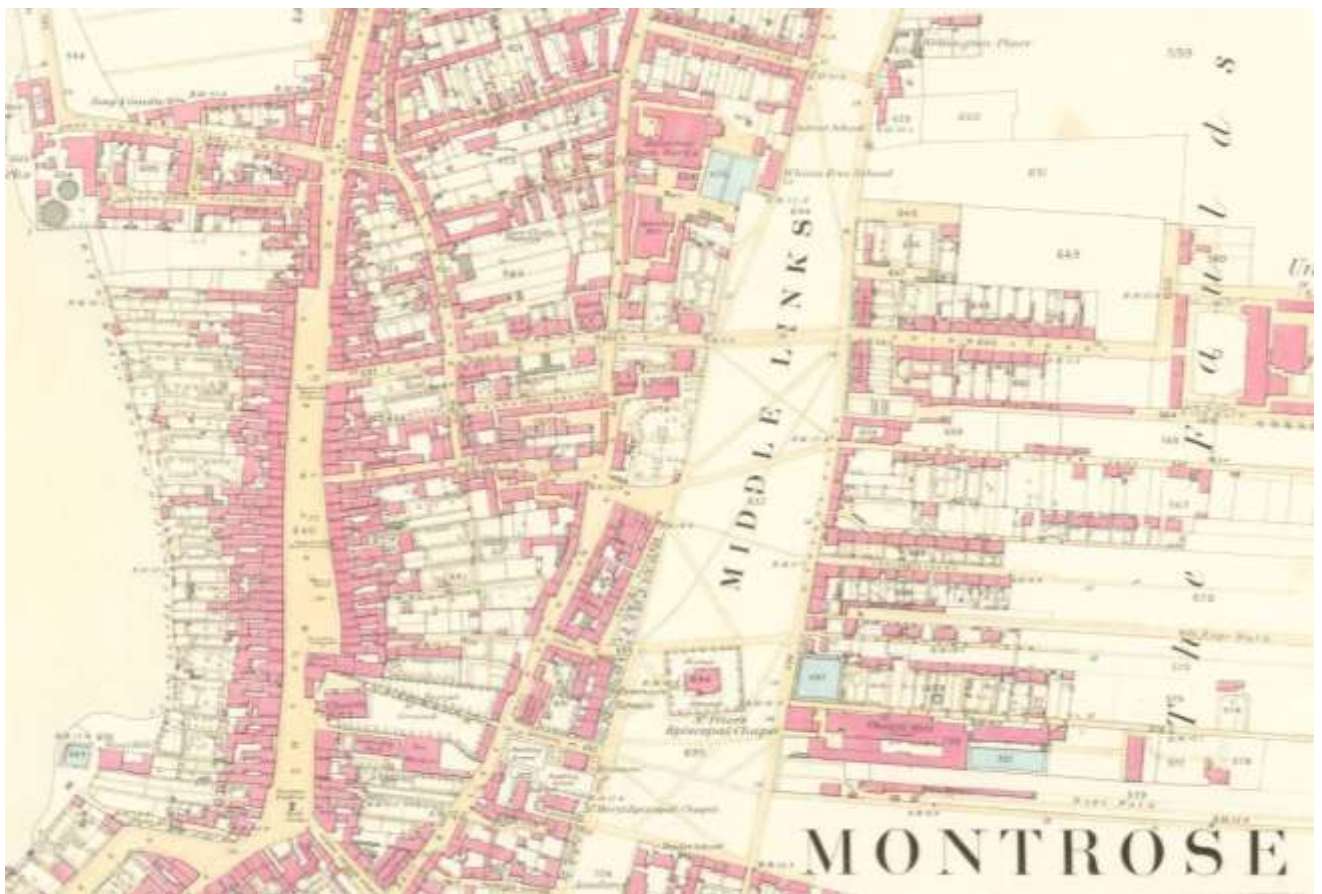
Groups I and J unite for a short guided walk with guides from Montrose Civic Society. Starting and ending at Links Hotel, Mid Links. At its core is an early 19th century house, given a make-over c1890 - William de Morgan tiles, stained glass at the stair- but we will occupy the extension for our lecture. The sites seen may include, amongst others:

- a) Dean's Lamp/Fountain by McDowall, Steven and Co, Glasgow (and from 1904, Falkirk), 1881, one of several items of public statuary recently improved through HLF 'Parks for People'.
- b) Chapel Works, flax spinning mills of J & G Paton, 1828-1874, largest spinners in Angus, but suffered a fire as conversion started so is mainly new build. 1840s double beam engine house under cast iron inverted T-section beams, intended to form the centre of something very large indeed. *(right, in 1994, before development, Mark Watson)*. The front to the Links and a classical warehouse at the west end await conversion, but most of the complex is now in productive use.
- c) Ropeworks, Bents Road, originally open-air and most remarkable for its use of whalebones to guide the ropes.



Below, the second and third Montrose bridges, by Samuel Brown and E.O. Williams, demolished (source, Watson postcard collection, postmarked 1903 and 1945)





Montrose, 1st Edition O.S. map, showing gable-end houses and rigs running at right angles to High Street, the parallel Mid Links, and two flax spinning mills, around which are three flax mills, three rope walks and other industry. The railway line is on the east rather than, as now and from 1883, the west side of the burgh.

Wednesday 14 August coaches start from Perth Road/ Airlie Place at 9.00, returning at 17.00 to Verdant Works, West Henderson's Wynd. Proceed on foot or by coach to DUSA, Airlie Place at 19.00

K Angus Coast O.S. Landranger 54 (gazetteer AR, AN) with Russel Coleman, Torsten Haak, Glasgow City Heritage Trust, Mark Watson and Colin Tennant, Historic Scotland. We will run buses K1 and K2 to the same places until 3pm, then K1 goes to Barry Mill and K2 to Denfind Quarry and Monikie Reservoir. (Below, aerial view of Arbroath harbour and signal tower, 2008 [RCAHMS: Crown © DP045418])

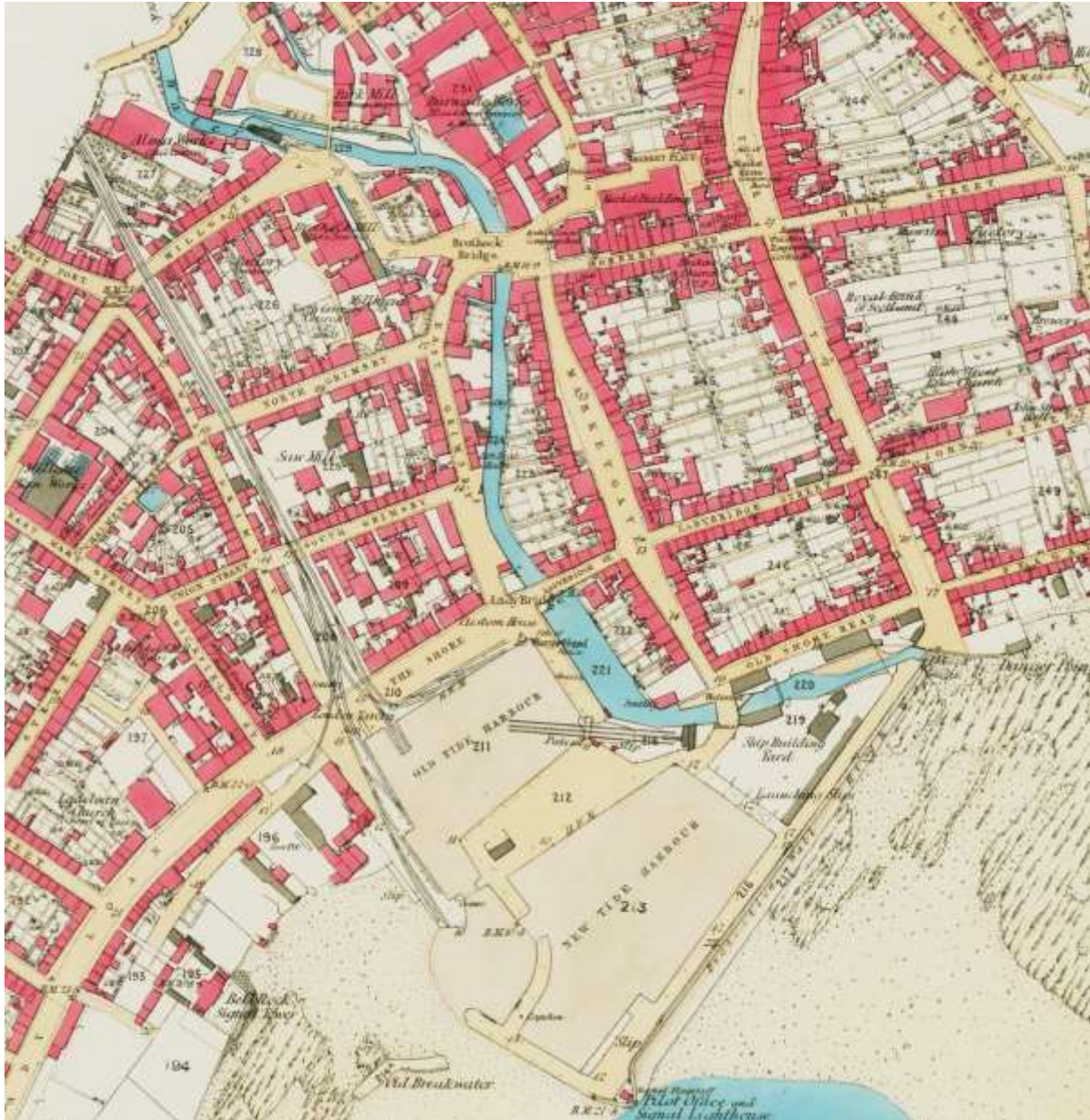
Arbroath Harbour NO 6418 4044, NO64SW 28, medieval in origin, was improved by John Gibb in 1838-9 and then enlarged by James Leslie in 1841-46 to contain an area of 2.4 hectares within sea-walls of red sandstone. A D-plan pilot house at the end of the breakwater is topped by a leading light and two later lights, timber and brick, are near the Signal Tower. The wrought iron gates are now kept open. The piers were built on rock to either side of the dredged river channel. The old harbour of 1725 was converted into a wet dock in 1877. A patent slip by Morton of Leith (?c1820-30, relocated c1860-80), uses original gearing, coupled to a motor, no longer steam, to haul fishing boats at McKay's boatyard. The rails have "Morton Patent" cast into them. This, the "Black Shed" and a mass concrete sail loft were repaired through a Townscape Heritage Initiative.



A new harbour visitor centre was completed in 2007 -shop, café and tourist information, where once was a boatyard behind the Lifeboat house. Ref JR Hume, *Harbour Lights* (SVBWG, 1997)

Signal Tower Museum (AB4, Angus Council) NO 64051 40447, NO64SW 54, was built in 1814 by Robert Stevenson to communicate with the Bell Rock lighthouse. Stevenson and John Rennie completed that in 1807- 1811, the oldest surviving lighthouse to be built on a rock that is completely under water at every tide. The elevated narrow gauge railway used to build the lighthouse is still in position out at sea. Iron-framed shelters to either side of the courtyard reroofed in Carmyllie flags.

References: Paxton RA, *Dynasty of Engineers – the Stevensons and the Bell Rock* (Northern Lighthouse Heritage Trust, 2011); www.Bellrock.org.uk



Arbroath, 1st Edition O.S. Map 1856. This shows that the patent slip was originally angled into the Old Tide Harbour, and only later shifted into what is now MacKay's boatyard. So it may actually predate the 1839 New Harbour. Railways run onto a pier for Carmyllie stone exports. The "Fit 'o the Toun", bottom right, is known for its smokies, haddock smoked in barrels. Top left, Alma Works and Brothock Mill survive in a housing use, and top right, Market Buildings, 1852-5 and 1912, is now a pub. By courtesy of National Library of Scotland.

Brothock Mill, 1806 (NO 6412 4084, NO64SW 118), four-storey, the middle arched windows, fronted a Boulton and Watt engine that was started by James Watt himself walking onto the beam. Columns have curved brackets in the earlier part. A c. 1880 fireproof addition to the north has floors of multiple arched spans, although having a similar external appearance. This recently was the printing works for the *Arbroath Herald* and is now (2013) being converted to flats.



Alma Works, 1856. Francis Webster wove sailcloth and tarpaulins, the last large-scale linen manufacturers in Scotland. A four-storey part-fireproof building has been converted to flats.

Arbroath station, (NO 6389 4099, NO64SW 108) was at first two separate termini, for the Arbroath & Forfar and for the Dundee & Arbroath railways in 1839. Through passengers walked from one to the other terminus until a deep rock cutting was made in 1845 by John Miller. The platforms were remodelled in 1911. The crane had been in front of an early engine shed.

Keptie Hill Water Tower, Hillside Road, Arbroath. NO 63534 40785, NO64SW 130. Three cast iron water cisterns in a stone castle-like edifice by WG Lamond, built 1885.

Fishtown of Usan Saltpan and Icehouse, 2.5 miles south of Montrose, NO 72592 54572. 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. Now it contains modern refrigeration equipment. A projecting chimney, blocked ventilation windows and water inlet attest to the original function. Footings of an ancillary building can be seen to the south of the main structure. A shallow man-made channel, grooved for a sluice gate at its seaward end, acted as a preliminary evaporation area. The man-made channel to the sea is wide enough for boats. Fisherhouses terrace pierced by a tall lookout/ water tower, coastguard station and a Rocket House incorporated into a dwelling house. AN41 *Usan fishing station is still in operation so you may see nets hung on poles to dry, fishing gear with sharp points, grease and other potential hazards.*



(left, Parish of Craig, showing Lime Works and Fishing village, OSA, 1793)

Boddin Point, NO 71307 53451, 3 miles S of Montrose. A fishing station that works in combination with Usan, comprising icehouse, fishhouse and bothies (one roofless). Picturesquely-sited 18th century limekilns built by Robert Scott of Dunninald. Part has recently fallen into the sea, and the boat slip more recently still. Recording of sites affected by coastal erosion is an important function of the SCAPE Trust.

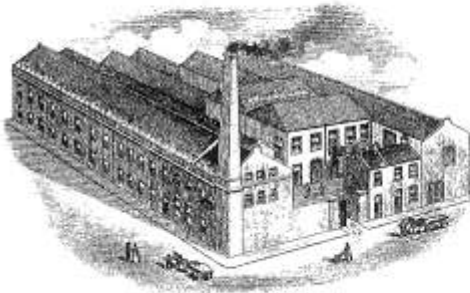
AN35. *Bring a torch to see the icehouse. Beware of cliff edge and unsafe kiln.*

Denfind or Pitairlie Quarry, near Monikie in Angus, Scotland began operating in the mid-19th century. Stone from the Dundee Flagstone Formation, in particular from Carmyllie Quarry, has long been important for building, roofing and paving, in the local area and further afield. Operations ceased in 1915 but the Denfind Stone Co has recently re-opened, recycling stone from spoil heaps. Brian Binnie, the farmer/owner, intends to extract reserves of in-situ stone. *Quarries are dangerous places. Please follow the instructions given by those responsible for the quarry.*

Ref, Everett, Paul A.; Tracey, Emily A.; Albornoz-Parra, Luis; Gillespie, Martin. *An historical and petrological assessment of Pitairlie Quarry, Angus*, 2011

Monikie Reservoir was engineered in 1845-8 by James Leslie for the Dundee Water Co, for 30 years the principal water resource for the city. The three basins, retained by earthen embankments and a puddled core, closed as the city's water supply in 1979, after Backwater Dam was connected. Monikie is now a country park for water sports, recreation and nature conservation. A sluice valve is on display and others are in position in the ponds. A small bus might be able to follow the route into Dundee via Burnside of Duntrune Aqueduct, also 1845-8, if we are making good time.

TELEPHONE NO. 3915. 5144 CODES USED:
 TELEGRAPHIC ADDRESS: LIEBER'S AND A.S.C.
 "VERDANT, DUNDEE."

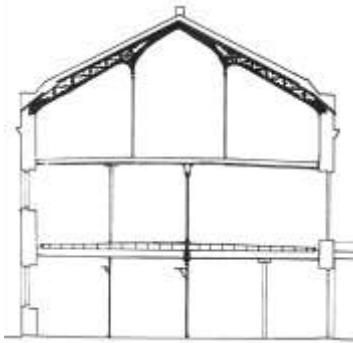


VERDANT WORKS
West Henderson's Wynd,
Dundee
 SCOTLAND

Bot. of Alexander Thomson & Sons

Forwarded per

Verdant Works (Museum, Dundee Heritage Trust) DW18, *West Henderson's Wynd, Milne Street.* NO 39529 30369, NO33SE 80. DW18.



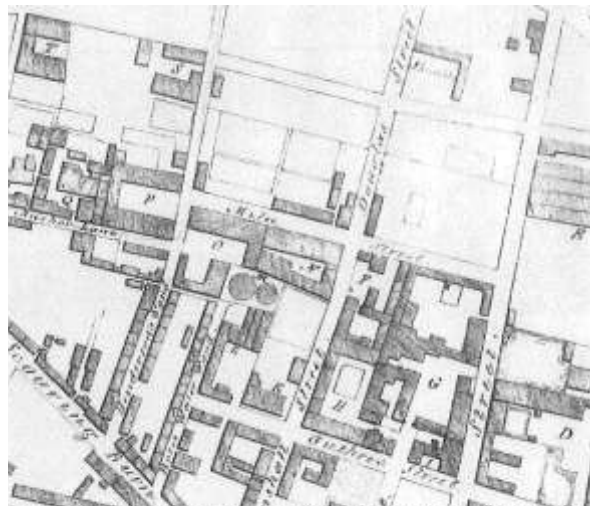
This flax spinning mill of 1833 has timber floors on columns with brackets for a horizontal drive shaft, and a gothic mansard cast-iron roof of 1852. Jute/flax spinning stopped in the 1880s. The mill was then used to process textile waste, flock, rabbit skins and scrap metal. Dundee Heritage Trust acquired the site in 1991 and opened initial phases in 1996/7. Textile machines are operated. The lodge and office furnishings are exactly as left by the previous occupiers. The Scouringburn culvert runs diagonally under the site, outlined in the floor, as is a gas holder, and there also is an artesian well. The three boilers drew air through arches and out through a stone and brick chimney incorporated in the corner of the mill.

Fig left, section drawn by Phil Parker, Miriam McDonald and Mark Watson. Top, letter heading still used by Alexander Thomson and Sons in 1980s.

Also at Verdant Works is a recently-discovered flywheel of a small steam engine of c.1850. It was found flat under the floor of Park Mill, Douglas Street, (just north of T on map below) being redeveloped after fire in 2007. It was supplemented by a bigger horizontal engine from c1865, and had been adapted for rope driving. By 1920 spinning had ceased as Park Mill became the HQ of JF Robertson and Co.

St David's Parish, 1839 (Dundee Central Libraries)

D Spinning Mill (Hospital Ward)	William Boyack
E Power loom factory (Dudhope)	Alexander Rowan
F Millwright & machine works (Douglas Foundry)	Umpherston & Kerr
G Foundry & Steam engine (Ward)	J&C Carmichael
H Spinning Mill (East/ North Mills)	J&W Brown
I Do. (Column)	John Brown
J Do. (South) [below Guthrie St]	J&W Brown
K Do. (Bell/ West Ward)	Andrew Brown
L Flour Mill (West Ward)	Walter Jamieson
M Gasometer	Dundee Gas Light Co
N Spinning Mill (Miln St)	Johnston & Wylie
O Do. (Verdant)	David Lindsay
P Do (South Dudhope Mill)	Alexander Davie
Q Do. (Anchor)	Trustees of the Late Wm Gray
R Do. (West Dudhope)	James Low
S Do. (Meadow)	Charles Smith
T Do. (Douglas Mill)	Trustees of Robert Gilroy





Left: Errol brick and tile works in 2008. The clay pit is top right and foreground (DP045324, © RCAHMS, 2008).

Below, Inchcoonans or Errol Brickworks in 1976 (SC502410, J R Hume collection at RCAHMS)



Errol Brick Works, Perthshire, 1 mile NW of Errol, on Loan Brae, NO2385 2333. Originally known as Inchcoonans Tile Works, the works existed prior to 1863 and by 1902 had expanded to include a tramway and a siding from the standard gauge railway west of Inchcoonans Station (Caledonian, Dundee and Perth Branch). In 1979 there was a rectangular downdraught, two round downdraught, one tunnel type, and one modern shuttle kiln. The railway siding and tramway to the quarry had been removed (G Douglas and M Oglethorpe 1993, visited 1979, NMRS, MS/500/54/3). Trading as Errol Bricks, the site closed in 2011. CG4.

Deanston Cotton Works and Village, near Doune, Stirling Council area

9 miles from Stirling, off the A84, south side at Teith Bridge NO715 016, (centred)

Deanston is one of several model factories built in Scotland during the water power phase of textile production in the 1780s. Along with sites such as New Lanark (Lanarkshire), Stanley (Perthshire) and Catrine (Ayrshire), Deanston was a full time factory-basis cotton mill built to accommodate Arkwright's water-frame and Crompton's Spinning Mule.



Aerial view of Deanston. The works/ distillery in the centre, former manager's house left, the factory village with barrack style blocks aligned with the lade. (DP107408, RCAHMS, 2011) Former wheel house, now turbine house, view of flume and adjusting sluices which regulated water flow to the water wheels (DP133704, RCAHMS copyright); Watson postcard collection showing jenny mill, no postmark.

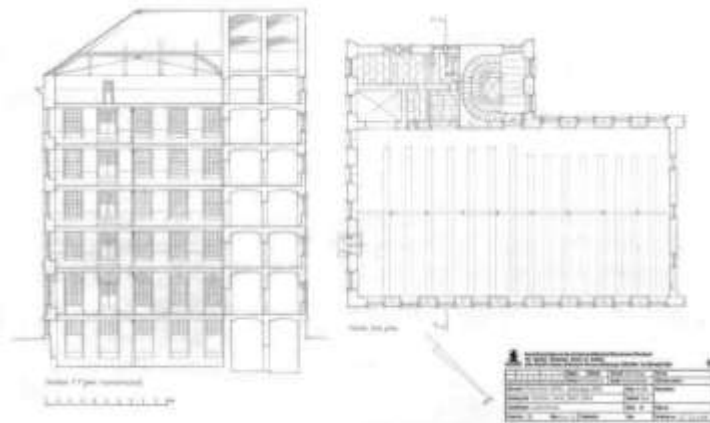
Founded in 1785 by the Buchanan Brothers, it was John Buchanan who was attracted to the River Teith and the ready workforce available in the village of Doune. An existing former lint dressing mill, weir and dam were utilised, the lint mill being filled with carding and roving machinery, the rovings being spun into yarn in a newly- built jenny factory nearby (demolished 1940s) with 700 employees

and a street of houses. Deanston (or Adelphi Cotton Works as it was known) was sold in 1793, suffered a fire in 1796, and was eventually bought by James Finlay and Company Ltd in 1806. In 1808 James Smith (a Buchanan nephew) became manager and he went about introducing power weaving and generally remodelling the works during his tenure.

Prior to 1821 the works had two undershot wheels producing 80hp, and had 500 workers. A new weir (1826) was built a mile upstream (the earlier weir can be seen at NS7118 0193), a new lade was built, a wheelhouse to accommodate 8 water wheels (only four ever installed, two by Fairbairn and Lillie, 1830, and two built at Deanston and installed 1832 and 1833, each potentially producing 75hp, all demolished) was constructed. The wrought iron flume or pentrough, supported on cast iron columns, and regulating sluices for four water wheels are still in situ in the former wheel house (now the turbine house). A company now leases the turbine house from the distillery to generate electricity, the lade water also being used to cool the distillery processes.

A new 7 floor L-shaped building (the first phase of a more ambitious plan) was built c. 1830 for processing cotton, each floor accessed by a stone staircase and connected to fireproof areas containing toilets and rooms for the 'overseers'. The first two floors of the mill building were fireproof (now removed), the rest are of wood supported on beams and cast iron columns. Vents between windows on each floor allowed ventilation and the windows could be opened. In the 1830s it is reported that 'various apartments' are heated with steam and lit with gas. Deanston's gasworks,

now demolished, also supplied the village. The population by 1839 was about 1200.⁷



Section and fourth floor plan of Deanston Spinning Mill (SC1322818, ©RCAHMS, 2012) ,DP133737,© RCAHMS

In 1834 a new power loom weaving shed was begun. Covering over half an acre (over 2,660 square metres) roofed by 21 groined arches supported by thick walls and cast iron columns originally carrying overhead belt drives (removed), the middle of each arch there is an opening originally capped by glass cupolas which allowed natural light to flood into the shed. The roof was reportedly plastered and tar-covered over externally and covered with soil to regulate the temperature within the weaving shed. This important building with its unusual roof structure is like that at Marshall's Mill in Leeds, although Deanston lost its arch cupolas when the building was converted into a bonded store in the mid- 1960s and does not have a façade, being built into the slope. Internally, it is subdivided by brick walls and the floor has been concreted over to minimise explosion and fire risk. The earthen roof layer has also been removed at some point in the past.

⁷ Reports of the Inspectors of Factories to [Principal] Secretary of State for the Home Department, for half year ending 31 December 1838, London, HMSO 1839, Report by Mr Stuart, January 1839, No.V, Mr James Smith's statement as to the Cotton Works in the County of Perth. Communicated by him to Mr Stuart.



Interior of former weaving shed, now duty warehouse no. 2 (DP133664 RCAHMS Copyright, 2012) and from above (DP047088 RCAHMS Copyright, 2012)

In the late 1940s, reconstruction of the mill buildings involved demolition of the Arkwright-style mill of the 1780s, the removal of the waterwheels and installation of 450kW turbines. Textile production ceased in 1965, Finlay and Co. Ltd concentrating on the other mill at Catrine, Ayrshire. The site was converted into a distillery in 1965 and continues to thrive as such, with two pairs of stills and an open mash tun. The basement and first two floors of the L-shaped mill building houses the distillery and the upper three flats and attic are not actively used. A visitor centre opened in 2012.

Nosing: “fragrant, medium-bodied, malty, honeyed and nutty” (Smith and Wallace, *Discovering Scotland’s Distilleries* 2010)

Housing was initially a thatched row opposite the Arkwright mill. This gave way to the tenements lying along the lade, two storey with some adjustments visible where houses were remodelled to give more than the original single room per household.



Blacker Bombard Spigot mortar, 1943; Deanston, Spigot mortar mounting and magazine (DP047102, © RCAHMS, 2008) and 1st Edition OS map, National Library of Scotland

Deanston Spigot Mortar, S of the road leading to Deanston Mill, 131m SE of the Distillery car park.

This concrete spigot mortar mounting is situated in dense undergrowth about 131m SE of the Deanston Distillery shop car park. Spigot mortars were anti-tank weapons supplied to the Home Guard and other army units. This spigot mortar emplacement consists of a centrally positioned concrete pillar on which there was a pin or spigot on a base plate and onto which the mortar would be placed. The concrete compartment on the S side of the emplacement is probably an ammunition locker. The locker is lined with corrugated iron and there are traces of wood at the doorway suggesting a wooden door frame. NN7171 0135

Tullibardine Distillery, Blackford, was built to distill malt whisky on the site of a brewery in 1949, to designs of by W Delme Evans. It was enlarged from two to four stills in 1974 and a retail complex occupied much of the site from 2003. Nosing with Gavin Cuninghame: “sweet and creamy with vanilla, fruit, nuts and spice” (Smith and Wallace, *Discovering Scotland’s Distilleries* 2010)

Gleneagles Maltings, Blackford. This brewery and maltings dates mostly from 1896, brewing ceasing before it became a solely a maltings in 1931. Now owned by Highland Spring, the maltings building (minus the double kilns at its east end) is a 4 storey, rubble building with floors supported on

wrought iron beams and cast iron columns. As Gleneagles Maltings it was the last independent commercial floor maltings in Scotland, closing in 1989.

Ref John Hume: *Industrial Archaeology of Scotland* Vol. II p. 255.

(text and illustrations prepared by Miriam McDonald)

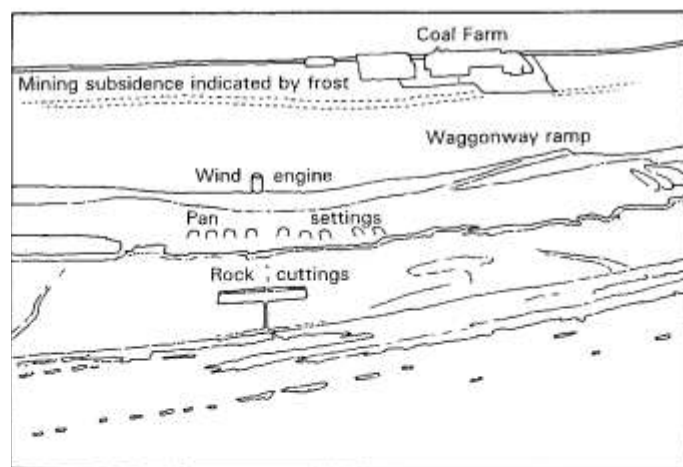
M Thursday 15 August North East Fife (gazetteer F) O.S. Landranger 59

With Jennifer Reid, NMS, Mark Watson, HS, and Colin and Paula Martin, maritime archaeologists

Coach starts from Perth Road/ Airlie Place at 9.00, goes via Cupar (seeing Sugar silo and other sites in Gazetteer F without stopping), then works along the East Neuk coast, dropping at Leuchars and Dundee stations, returning to Seabraes at 18.00

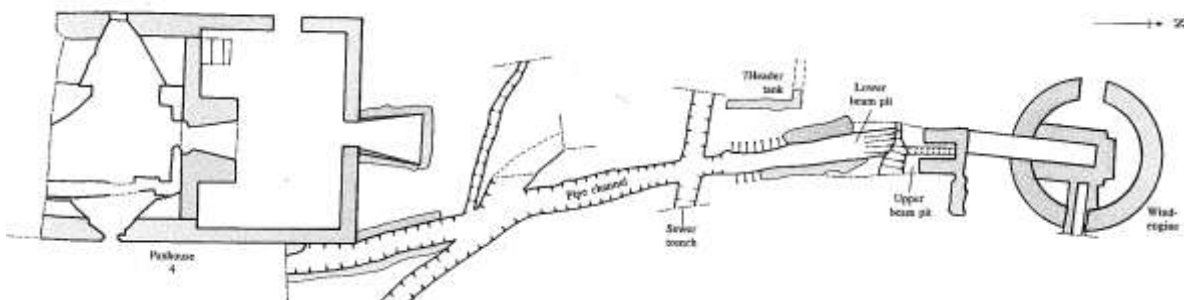


Newark Coal and Salt Work Company, St Monans on A917, 1 1/2 miles W of Pittenweem, NO534019 (15 minutes walk on Fife coastal path).

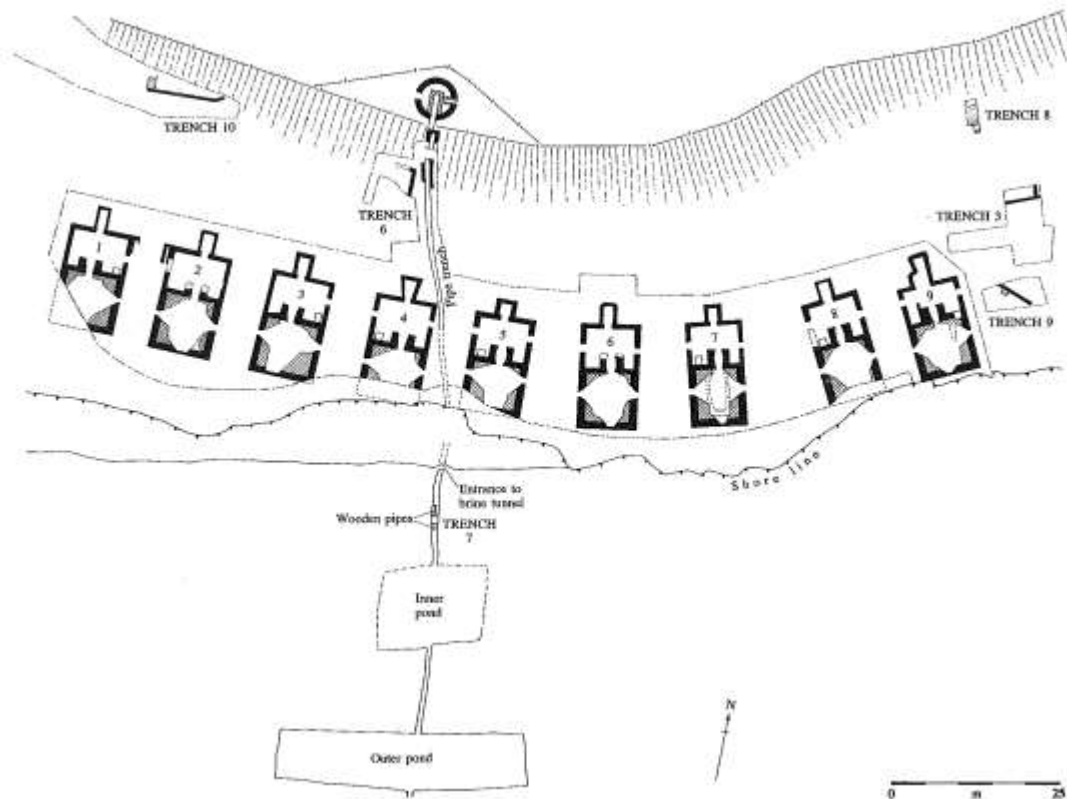


Remains of nine saltpans, their associated waterworks system, and a windmill date from the foundation of the company in 1771 with some later modifications until production petered out in the early 19th century. Traces of earlier coal workings and a wagon-way, can be seen in the landscape. They were excavated in 1994-6 by Robin Murdoch of Scotia Archaeology, and he will be there to interpret them to us. The key to the wind engine is kept in the local newsagent's shop. (*Aerial photo of dig © Fife Council; drawings © Scotia Archaeology on this and the following page*)

Another site near Crail has also been excavated (by SCAPE) in advance of coastal erosion.



Pan house 4, the north end of the pipe channel, the lower and upper beam pits and the wind engine (Scotia Archaeology)



Outlines of the excavation trenches are dotted (Scotia Archaeology)

Anstruther is the main town in the East Neuk. The AIA (Anstruther Improvement Association) has started work on a Townscape Heritage Initiative with King Creosote and music as its USP.

The Scottish Fisheries Museum, Anstruther, has an extensive collection of boats and a Zulu class drifter in the harbour. It forms a recognized national collection, and is one of several managed as an independent museum. *Lunch will be self-bought.*

Crail Airfield/ Royal Naval Air Station HMS Jackdaw. Its 48 buildings and star-plan runways are from the 1940-1958 period, when they were used by Fairey Swordfish and Barracuda. In 1960 it became a pig farm and raceway. The Airfield will be seen from the coach, which given time, will turn into the Bird reserve car park and out again, close to an impressive 4-stage control tower.

Fife Ness. From the lower golf car park, walk on tarmac paths past a farm steading, noting bee boles for overwintering of beehives on shelves in a wall, to view a tide mill. This will be interpreted for us by Colin and Paula Martin. A circular groove in rock appears to be a construction platform for laying out the masonry of the beacon at North Carr Rock, or for a crane. Robert Stevenson attempted to construct this from 1810, and finally completed it in 1817 only to see it washed away. He then opted to build a six-legged cast iron beacon, that still exists today as a day mark. It was superseded by a lightship from 1877, the third of which, the *North Carr*, is moored in Victoria Dock, Dundee, (having previously been at Anstruther until battered by a large wave), and now by a buoy is kept lit by Northern Lighthouse Board.

15.40 group F1 gets dropped at Guardbridge paper mill, walks to Eden Brewery in that complex for tour and sampling.

15.50 bus goes to Leuchars station (16.18 direct East Coast train) then collects F2

16.15 Group F2 tours Brewery

17.00 depart Guardbridge

17.15 View of Tay Road Bridge from Newport, then return to Dundee rail station and Seabraes.



- | | |
|--------------------------------------|-------------------------------------------------------|
| 1 Wood Pulp Storage Sheds | 12 Former Brass Store |
| 2 Stock Preparation House | 13 Former Bleach Plant |
| 3 No. 4 Paper Machine | 14 Engine House for original No. 3 Paper Machine |
| 4 Broke Bleaching and Recovery Plant | 15 Stock Preparation for original No. 3 Paper Machine |
| 5 Effluent Treatment Plant | 16 Former Dye and Size House |
| 6 Calender House | 17 No. 5 Paper Machine |
| 7 Finishing Section | 18 No. 6 Paper Machine |
| 8 Stock Warehouse | 19 New No. 3 Paper Machine |
| 9 West Yard (central) | 20 Original No. 3 Paper Machine House |
| 10 Former Rag Store | 21 Reel Paper Store |
| 11 Former Oil Store | |

Guardbridge Paper Mill, (F29)

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 a dense mix of early nineteenth century masonry elements, mid to late nineteenth century brick-built buildings (some from the latter days of whisky distilling) with twentieth century insertions and additions. The west elevation of the site, facing Main Street, incorporates earlier masonry which relates to the distillery period. At the south end of the works is a long, one storey brick range near the main gate house, which originally housed a paper machine (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 later new paper machine range. The esparto boilers were decommissioned in the 1970s. The great quantities of ash produced from the coal-fired boilers were tipped into the estuary to create land for expansion of the site. The car park to the west of the mill is the site of the former condensing pond for the turbines; it was in-filled with brick and rubble from the demolished transit sheds in the 1980s. Housing for the paper mill workers was built to the west of the paper mill.

Guardbridge Paper Mill latterly concentrated on fine quality conservation standard security papers such as for cheques and ballot papers and was still using esparto grass in its paper until it closed in 2008. The site has been bought by the University of St Andrews to develop as a 'Green Energy Centre and a Knowledge Exchange Centre for spin-out companies'. An artisan brewery has opened on site. (By Miriam McDonald)

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

Jute Mill Song by Mary Brooksbank

<p><i>Oh dear me, the mill's gannin' fast</i></p> <p><i>The puir wee shifters canna get a rest</i></p> <p><i>Shiftin' bobbins coarse and fine</i> <i>They fairly mak' ye work for your ten and nine</i></p>	<p>Oh dear me, the (jute spinning) mill is gaining speed (the engine seems especially fast today, as they are so tired).</p> <p>The poor little children who change the bobbins on the spinning frames (working under female spinners), cannot get a rest,</p> <p>Changing bobbins of coarse and fine yarn</p> <p>The management really make you work hard for your ten shillings and ninepence [adult spinner's wage, more than a shifter was really paid]</p>
<p><i>Oh dear me, I wish the day was done</i></p> <p><i>Rinnin' up and doon the Pass it is nae fun</i></p> <p><i>Shiftin',</i> <i>piecin',</i></p> <p><i>spinnin' warp</i></p> <p><i>weft and</i></p> <p><i>twine</i> <i>Tae feed and clad my bairnie affen ten and nine</i></p>	<p>Oh dear me, I wish the working day was over.</p> <p>Running up and down the pass (passage way between machines) is no fun</p> <p>Changing bobbins, piecing (splicing together broken yarn. The children doing this are piecers)</p> <p>Spinning warp, the yarn that winds from beams along the length of the cloth</p> <p>Weft, the yarn that goes from side to side in a shuttle</p> <p>Twine, twisted yarn, like string</p> <p>To feed and clothe my baby from 10/9-</p>
<p><i>Oh dear me, the world is ill divided</i> <i>Them that works the hardest are the least provided</i> <i>I maun bide contented, dark days or fine</i></p> <p><i>For there's nae much pleasure livin' affen ten and nine</i></p>	<p>Oh dear me, the world is badly shared out</p> <p>Those that work hardest get the least recompense</p> <p>I must stay contented, through bad and good times</p> <p>For there is not much pleasure living off 10/9-</p>

And part of a song by Jim Reid:

<p>"Cox's, Halley's, Eagle, Craigie, Brochie's, Baxter's, Bowbrig, Cairds; I am getting tired o' working, but tae lose my job I'm feared..."</p>	<p>The names of 8 Dundee jute companies and their mills</p>
------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------

Dear Delegate,

Mark Watson and I welcome you to this conference at Dundee University. Mark has arranged a full and varied programme of lectures and visits, which promise to make for a very good conference.

As advised in the joining instructions the conference meals will be in the Air Bar, level 4 of the Student's union building, apart from lunch on Friday and Saturday, which will be in the foyer of the Lecture Theatre and dinner on Friday and Saturday. Lectures and exhibitions will be in the Tower Building on the Perth Road.

Name badges are colour coded to identify various classes of attendee. Those with red background are members of the council of the association. Blue are the local organisers and lecturers and green those attending for the first time. We especially welcome those attending for the first time. We would encourage regular attendees both to add their welcome and to involve first timers in the spirit of the conference.

The conference dinner on Saturday will also be on board H M S Unicorn. This year we have a pre-dinner reception funded by the Deputy Lord Provost as well as wine with the meal. The conference dinner is an opportunity for the Association to entertain guests. As a result delegates are advised that some tables will be reserved for those guests and the council members selected to entertain them. Delegates will be free to sit at any of the other tables.

Coaches for the various trips will depart from a suitable location to be advised.

Delegates are reminded that it is their responsibility to satisfy themselves that they are physically able to manage each visit prior to leaving the coach.

Delegates should also to take care at all times but especially when getting on and off coaches and when waiting to cross busy roads. Look right.

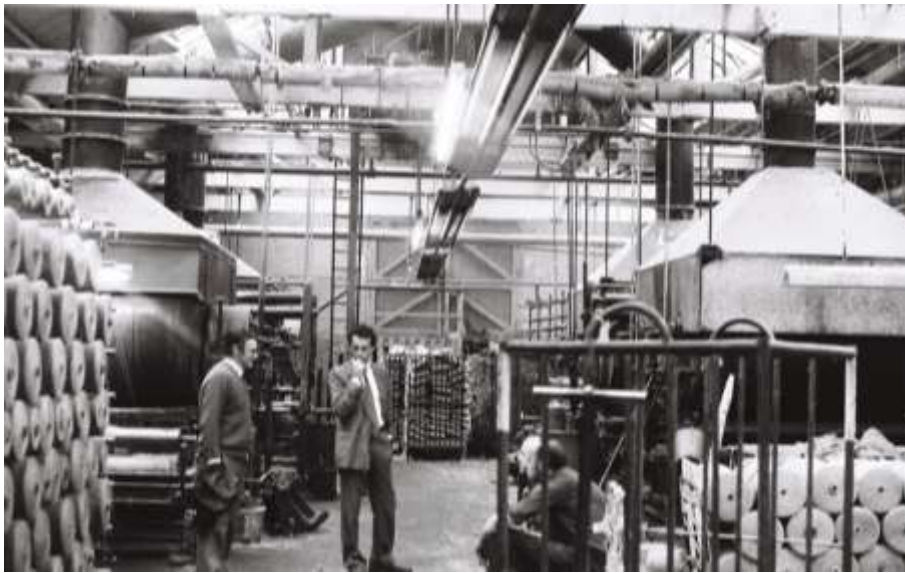
You are required to vacate your room on the day of leaving by 10am and to return your key to the janitor's office.

In the event of any problems or difficulties please contact me or for accommodation matters in the first place contact the university staff at Seabraes Halls.

Finally, I very much hope you will enjoy the conference and your stay in Scotland.

John McGuinness

Mark Watson may be contacted on 07580 560276



Jute beaming machines, SCWS Taybank Works, Arbroath Road, Dundee, with newly arrived Chief Executive of Dundee Heritage Jonathan Bryant, 1986, DE14

Acknowledgements

The many owners and occupiers of the sites we will visit show remarkable forbearance and even enthusiasm at the prospect of a swarm of industrial archaeologists. Thanks especially to Debbie Burton of Dundee and Angus Convention Bureau, who created the conference logo and found a succession of caterers for us. AIA Conference Secretary John McGuinness made several visits to keep the event on track and John Jones minded the finances.

STICK, the Scottish Transport and Industrial Collections Knowledge Network, and SIHS, the Scottish Industrial Heritage Society, are fundamental to the delivery of these visits. The several Townscape Heritage Initiatives completed in the region have also opened doors: Arbroath Abbey to Harbour, Brechin, Coupar Angus, Aberdeen the Green and, just starting, Anstruther.

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) 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, and many members of STICK (Scottish Industrial and Transport Collections Knowledge Network). For joining the fieldwork, Russel Coleman and Dave Bates (Scottish Industrial Heritage Society), Karen Thompson, Linda Ross, Jenn Reid, Jenny Brown and Rowan Brown (STICK), Colin and Paula Martin (East Neuk), Paul Mitchell, Margaret King and Sarah Kettles (Angus Council), Neil Grieve and the researches of students in Urban European Conservation (Dundee University).

For archives, Tam Burke and Margaret Brown, National Library of Scotland, Pat Whatley, Dundee University, Fiona Scharlau, Angus Archives, Dundee Central Libraries, Iain 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, Lindsay Farquharson, HS, and Miriam McDonald, RCAHMS, contributed text and illustrations.

Sponsors: Historic Scotland, the Ballast Trust and Dundee City Council

Cover: Key to Gazetteer sites in Dundee west, centre and east. Overlaid by Miriam McDonald on Goole Earth satellite image