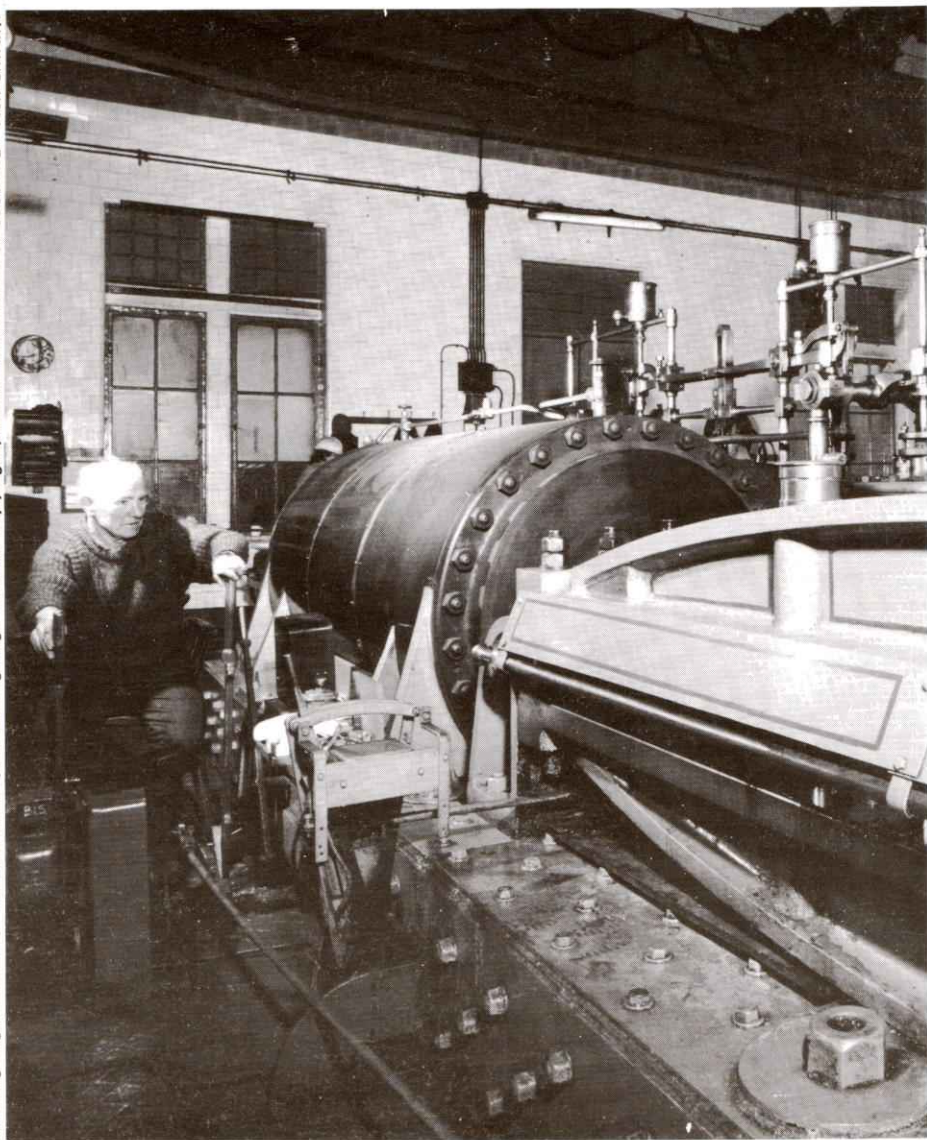


Sixty Industrial Archaeological sites in **SCOTLAND**

Winding engine at Lady Victoria colliery, Newtongrange (Crown Copyright, National Museums of Scotland: Ken Smith).



Sixty Industrial Archaeological sites in **SCOTLAND**

Preface. This guide to some of the outstanding industrial archaeological sites in Scotland has been compiled by members of the Scottish Industrial Heritage Society. The impetus for its production was provided by the 1985 Conference of the Association for Industrial Archaeology being held in Glasgow. However, it is hoped that the booklet will have a wider appeal and perhaps serve to develop a greater interest in the industrial archaeology of Scotland. No claim is made that it is comprehensive. It could not possibly be, as Scotland forms a surprisingly large proportion of the land mass of Britain and has a great many important industrial monuments.

With only a small number of the many worthwhile sites being included, the selection inevitably strongly reflects the personal interests and knowledge of the compilers. Unavoidably too, the choice of sites is determined by what survives. In Scotland, perhaps more so than elsewhere, there are a great many magnificent buildings and structures associated with various forms of transport, whereas significant relics of some major manufacturing industries have all but vanished. A number of the sites chosen are now museums and are open to the public on a regular basis. In general the others can be viewed at least externally without the need for any special arrangements.

This publication would not have materialised without the co-operation of many people. The Committee of the Scottish Industrial Heritage Society would like to thank the following: Lorna Main, Frances Sander, Christine Thompson, Gillian Wood, John Clayson, Martin Hughson, Eric Watt, Andrew Wood and James Wood. Special acknowledgment is necessary for the contribution of John Hume who willingly allowed the compilers to make free use of his numerous published works on the industrial archaeology of Scotland.

Introduction. Variety is a key word in any attempt to summarise the industrial history and industrial archaeology of Scotland. This is a reflection of the country's physical and cultural diversity and of the strong contrast between the Lowlands and the Borders on the one hand and the Highlands and Islands on the other.

The Lowlands and Borders illustrate that variety in the range of their products. All manner of textiles, pottery, glass, a wide range of chemicals, heavy and light engineering products, coal, iron, copper, lead, lime, beer, whisky, flour, oatmeal and a host of other items flowed from the mills, mines and workshops of this area. Not only had the west of Scotland a good claim to be the 'workshop of the British Empire', but the woollen and hosiery areas of Stirlingshire, Clackmannanshire and the Borders became renowned all over the world for high-quality produce. Even before the Industrial Revolution, there were well-developed trade routes and many small-scale mining, manufacturing and processing units.

From about 1760 onwards, as the pace of industrialization increased in Britain, lowland Scotland with its rich resources of ironstone and coal developed rapidly, and in certain industries, such as cotton spinning and iron smelting, assumed an importance out of proportion to its size. This expansion was, as elsewhere, accompanied by agricultural improvement and by concentration of industry in towns. The coming of the railways opened up new areas for industrial activity and allowed towns hitherto handicapped by the high cost of fuel, such as the Border woollen towns, to develop large-scale manufacturing enterprises.

In the later nineteenth century some of the industries went into relative decline, but their place was taken by continued expansion of existing specializations, and by the introduction of new products, such as sewing machines, bicycles, motor cars and steel roofs and frames for buildings. Expansion and contraction were not, of course, continuous processes: the periodic booms and slumps with which we are familiar were even more pronounced in Victorian times, and they conditioned the attitudes of manufacturers to investment in new factories. One consequence was the adaptive re-use of suitable old buildings for new machinery and new processes, which has resulted in the survival of

some of the buildings included in this guide.

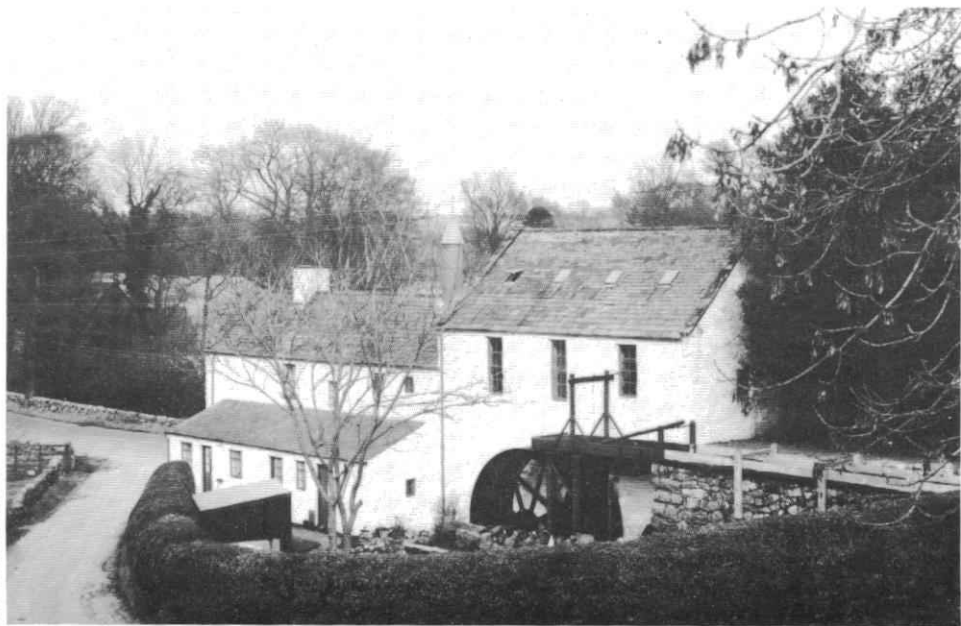
The Highlands and Islands are much more varied in climate and geographical characteristics than the Lowlands and Borders. Though the area is largely mountainous, the eastern rim is partly lowland and the coastal plain and wider valleys have closer ties with the Lowlands proper than with the rugged mountain areas to the west. The highland pattern of small communities, widely dispersed through mountainous country intersected by long sea-lochs and by rivers of considerable size or on islands in stormy seas has always made transport and communication difficult and hence, until comparatively recently, distinctive forms of social and, to some extent, industrial organization have prevailed.

The region had very little coal, and only scattered pockets of other minerals, so that as one moves away from the central coalfields, industrial establishments become more scattered, in general smaller in scale, and more closely linked to agriculture, fishing and quarrying. Attempts to bring the Highlands and the Highlanders (or the Islands and the Islanders) into line with the Lowlands have been made for many centuries, and relics of some of these ventures are still scattered over the region. Because a largely

'pre-industrial' society persisted for so long, and because pressure on land has declined rather than increased — in part owing to voluntary emigration, in part through deliberate clearance — there is unusual scope in this area for the industrial archaeologist.

The food and drink industries, for instance grain milling, whisky distilling and fishing, were both extensive and relatively important. The textile industries have been historically both significant and varied and active on a large scale in Angus, Perthshire and the city of Dundee. The native iron smelting industry ceased to exist more than a century ago, but aluminium smelting is still important. The recent advent of oil-platform construction yards on both east and west coasts has tended to obscure the engineering achievements of firms in the cities and towns of the region. Mining and quarrying have left their mark all over the Highlands and Islands, and the associated processing industries of brick and tile making and lime burning have been locally important, though the latter is now extinct.

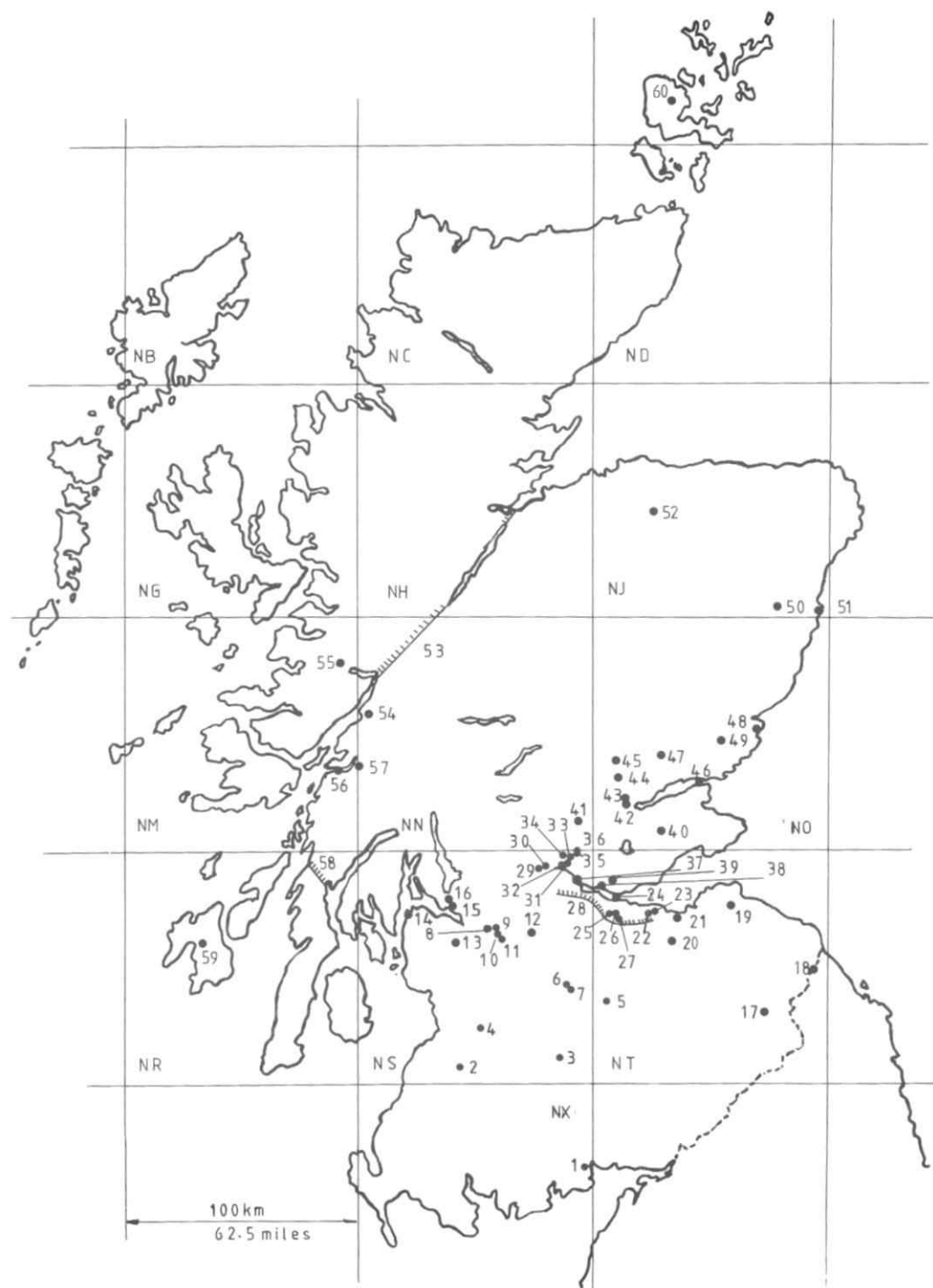
The most striking 'industrial monuments' of the area, however, are certainly those associated with transport. Some, like the Caledonian Canal and the Connel Ferry Bridge, are significant by



Sixty IA sites in Scotland

Location map

1. *New Abbey Corn Mill*
2. *Dalmellington Ironworks, Waterside*
3. *Lead Mining and Smelting, Wanlockhead*
4. *Ballochmyle Railway Viaduct*
5. *Biggar Gasworks*
6. *New Lanark Mills and Village*
7. *Bonnington Hydro-Electric Power Station*
8. *Partick Pumping Station, Glasgow*
9. *Port Dundas Power Station, Glasgow*
10. *Queen St Railway Station, Glasgow*
11. *Templeton's Carpet Factory, Glasgow*
12. *Summerlee Ironworks, Coatbridge*
13. *Paton's Bootlace Factory, Johnstone*
14. *Cloch Lighthouse, Inverkip*
15. *Ship Model Test Tank, Dumbarton*
16. *Argyll Motor Works, Alexandria*
17. *Kelso Bridge*
18. *Union Suspension Bridge, Hutton*
19. *Preston Mill, East Lothian*
20. *Lady Victoria Colliery, Newtongrange*
21. *Cornish Pumping Engine, Prestongrange*
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23. *Cable Tramway Power Stations, Edinburgh*
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25. *Winchburgh Village*
26. *Shale Bings, West Lothian*
27. *Edinburgh and Glasgow Railway Viaducts*
28. *Edinburgh and Glasgow Union Canal*
29. *Hayford Mills, Stirling*
30. *Stirling Bridges*
31. *Alloa Wagon-way*
32. *Glass Cone, Alloa Glassworks*
33. *Devon Colliery Engine House, Fishcross*
34. *Strude Mill, Alva*
35. *Clock Mill, Tillicoultry*
36. *Wooden Dam, Tillicoultry*
37. *Road Bridge, Kincardine-on-Forth*
38. *Group of Limekilns, Charlestown*
39. *St Leonard's Works, Dunfermline*
40. *Ladybank Railway Station*
41. *Glenruthven Weaving Mill, Auchterarder*
42. *Perth Waterworks*
43. *Old Bridge, Perth*
44. *Stanley Mills*
45. *Linen Factory, Spittalfield*
46. *Tay Railway Bridge*
47. *Newtyle Railway Station*
48. *Boddin Limekilns and Ice-House, Nr Montrose*
49. *Dumbarrow Windmill, Nr Letham*
50. *Single Cylinder Beam Engine, Garlogie*
51. *Girdleness Lighthouse, Aberdeen*
52. *Craigellachie Bridge*
53. *Caledonian Canal*
54. *Slate Quarries, Ballachullish*
55. *Glenfinnan Railway Viaduct*
56. *Connel Bridge*
57. *Bonawe Ironworks*
58. *Crinan Canal*
59. *Bridgend Woollen Mill, Islay*
60. *'Click Mill', Dounby, Orkney*



any standards and many are outstanding in Scotland. The remainder, though less spectacular, do provide, particularly in the case of harbours and docks, evidence for the development from the eighteenth century and earlier, of facilities for the handling of various goods.

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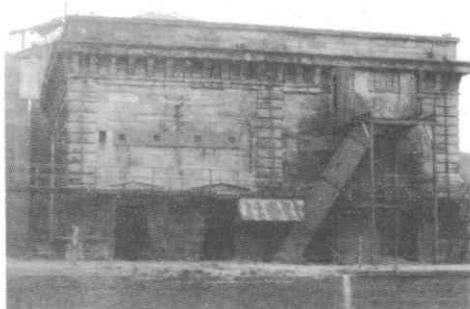
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1. **New Abbey Corn Mill** (NX 962665). There was a mill on this site in the 16th century, but the present two storey and attic rubble building with adjoining kiln and house probably dates from the late 18th century.

A 14ft 6in (4.42m) diameter by 5ft (1.52m) wide pitch-back water wheel of wood and iron construction drove three pairs of stones. Two pairs ground oats for human consumption while the third was used for animal feeding stuffs.

The mill continued in production at least until World War II. In the early 1970s it was restored by Mr Charles Stewart of Shambellie and gifted to the Secretary of State for Scotland. It is now in the Guardianship of the Historic Buildings and Monuments Directorate (Scottish Development Department).

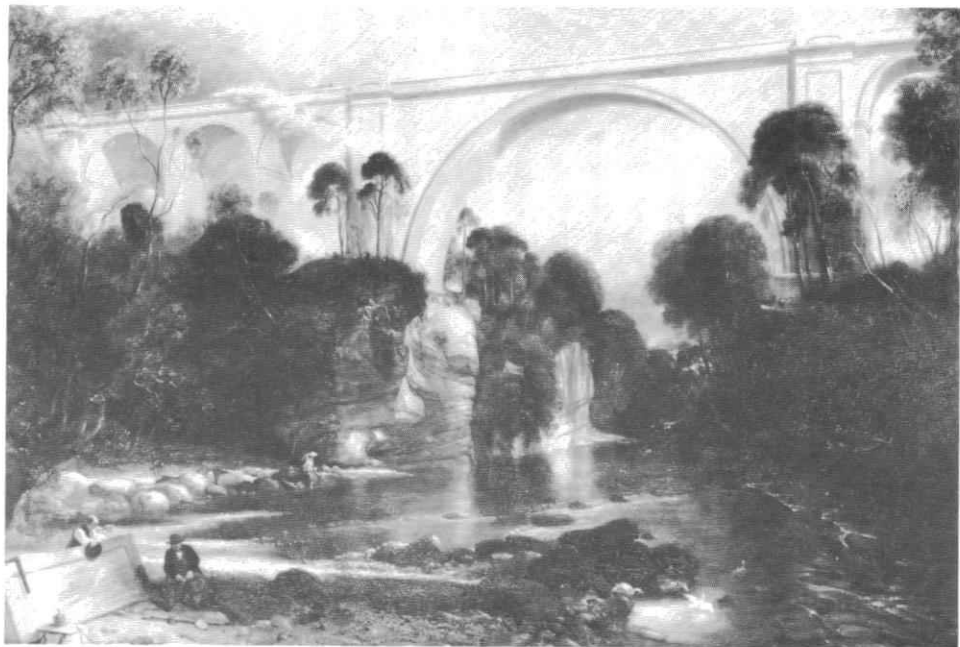


Blowing engine house, Dalmellington ironworks (J L Wood).

2. **Dalmellington Ironworks, Waterside** (NS442083). The works began production in 1848 and closed in 1921. Although much reduced, this site has the most substantial remains of any of the 19th century Scottish ironworks. Among the surviving buildings is the Italianate style engine house, which formerly contained the blowing engines built by Murdoch, Aitken and Co, Glasgow. After closure of the ironworks, the site became a brick-works and two Hoffman kilns remain.
The Dalmellington and District Conservation Trust has plans to create a museum of the iron, coal and brick industries.
3. **Remains of Lead Mining and Smelting, Wanlockhead** (NS 8713). Mining has a long history in the area. Lead ore may have been mined in Roman times and the industry was certainly well established by the late 17th century. Silver, zinc and gold were also found at various times, in addition to lead. The industry effectively closed down in the 1930s but there was a brief and unsuccessful attempt to revive it in 1957.

The most interesting survival is a unique 19th century water-bucket beam pumping engine at the Stratisteps mine (NS 875129). This has been taken into Guardianship by the Historic Buildings and Monuments Directorate (Scottish Development Department).

Among other interesting features are the Pates Knowes smelt mill, which worked from 1764 to 1842 and has been excavated and partially restored, and the Loch Nell mine. This is an adit, worked from the early 1700s to 1860



Ballochmyle viaduct, from a painting by D O Hill (Museum of Transport, Glasgow).

and now accessible to visitors. There is also a small museum.

4. **Ballochmyle Railway Viaduct** (NS 508254).

Built in 1846-8 for the Glasgow, Paisley, Kilmarnock and Ayr Railway's extension to Cumnock, this is a fine seven-arch masonry viaduct over the River Ayr. The 181ft (55.2m) semi-circular central span is said to be the longest masonry railway arch built. John Miller, creator of so much of the early Scottish railway system, was the engineer.

The line became part of the Glasgow and South Western Railway's main line to Carlisle. It has lost much of its former importance but it is still in use.

5. **Biggar Gasworks** (NT 040378). Now in the Guardianship of the Historic Buildings and Monuments Directorate (Scottish Development Department), Biggar is the only remaining gasworks in Scotland. The Royal Scottish Museum, Edinburgh, is responsible for the interpretation of the works for visitors.

Biggar is a traditional small scale works, with horizontal hand-charged retorts. There are nine

of these, in two settings with five and four retorts.

The works was established in 1839 by the Biggar Gas Light Company and continued in operation until 1973. It was altered at various stages of its life. In 1914 what was virtually a new works was built on an enlarged site, and much of the surviving plant dates from this period. The 1938 retort house became a coal store at this time and still exists. There are two gas holders, dating from 1858 and 1879, both rebuilt with a larger capacity in 1918 and 1939 respectively.

6. **New Lanark Mills and Village** (NS 880426).

Founded in 1784 by David Dale and Richard Arkwright, the New Lanark cotton spinning mills were later managed by Robert Owen, the social reformer. By 1799 it was the largest works of its kind in Scotland. The site was chosen because of the availability of water power. At one stage eleven water wheels were in use and in later years steam power was also employed.

There are four mill buildings of various dates and rows of three and four storey houses which at one time housed 2000 workers. Among other



Bigger gasworks (J L Wood).

important buildings are the Institute for the Formation of Character (1816) and the school (c1817). The mills remained in production until 1968.

Externally there have been few changes over the years but since the closure of the mills the New Lanark Conservation Trust has worked steadily to improve the houses. More recently the Trust has begun conservation work on the mills themselves following the departure of the scrap metal dealers who latterly occupied them.

7. **Bonnington Hydro-Electric Power Station**

(NS 889417). The Lanarkshire Hydro-Electric Power Company's scheme at the Falls of Clyde was the first large-scale hydro-electric installation in Britain for public supply. Bonnington is easily accessible by public footpath from New Lanark. The other station which forms part of the scheme is at Stonebyres (NS 850442). However this can be reached only by private road.

Bonnington, with two Francis turbine-driven generators of 5500kW each, was commissioned in 1927. Stonebyres, also with two Francis units,

but of 2750kW each, entered service the following year. At both stations, the generators were replaced in the early 1970s but the original turbines are still in service.

8. **Partick Pumping Station, Glasgow** (NS 564664).

This forms part of the Glasgow main drainage system. Commissioned in 1904 it was originally equipped with three vertical triple expansion steam pumping engines by Duncan Stewart and Co., Glasgow. These were scrapped c1960 and replaced by electric pumps. The station is still in operation.

The building is of red sandstone, in a style which appears to owe something to the Scottish fortified houses of an earlier age. Although disused since the scrapping of the steam plant, the fine octagonal chimney remains.

9. **Port Dundas Power Station, Glasgow**

(NS 587667). The late 1890s saw a growth rate of nearly 50% per annum in electricity demand in Glasgow. Port Dundas was one of the stations built by the Corporation Electricity

Department to meet this. The site is on the Forth and Clyde Canal which was used for coal delivery and as a source of cooling water for the condensers.

Such was the demand for current that generation started on the Port Dundas site early in 1899, using whatever plant was available 'off-the-shelf' from manufacturers. This was erected inside the planned outline of the power station and covered by a temporary structure. The first part of the present red brick building, the central section with its French Renaissance tower, was formally opened in September 1900. As the need for additional generating plant developed the two wings were added at different times.

Although generation ceased many years ago, the building continued to be used by the South of Scotland Electricity Board for other purposes, until recently. The site has now been sold for redevelopment.

10. **Queen Street Railway Station, Glasgow** (NS 592655). Queen Street was opened in 1842 as the terminus of the Edinburgh and Glasgow Railway but little or nothing of the original survives. The fine wrought iron arched roof, supported on cast iron columns, dated from 1878-80. The engineer for this was James Carsewell and the contractor P & W MacLellan, Glasgow.

The Edinburgh and Glasgow Railway was built on the level throughout except for a 1 in 42 descent, much of it in tunnel, from Cowairs to Queen Street. Originally Edinburgh-bound trains were assisted by a stationary haulage engine. The incline has to be tackled virtually from a standing start and even today it remains a considerable operational nuisance. From the end of platforms 3 and 4 the view up the tunnel incline is striking.

Queen Street low level station, opened in 1886 for suburban traffic (Glasgow City and District Railway), is still in use but like the main station, it has been much altered.

11. **Templeton's Carpet Factory, Glasgow** (NS 603641). This large complex of buildings of various dates was formerly occupied by James Templeton and Co. The most spectacular part is a four-storey plus attic block in Venetian style known locally as the 'Doges Palace', which overlooks Glasgow Green. This polychrome

brick building was completed in 1892 to the designs of William Leiper and is now Category A listed.

During a gale on 1 November 1869 most of the unfinished building was blown down, resulting in the death of 29 workers, mostly women, in adjoining weaving sheds.

When Templeton's moved from the site in the late 1970s the complex was converted by the Scottish Development Agency into units suitable for small businesses.

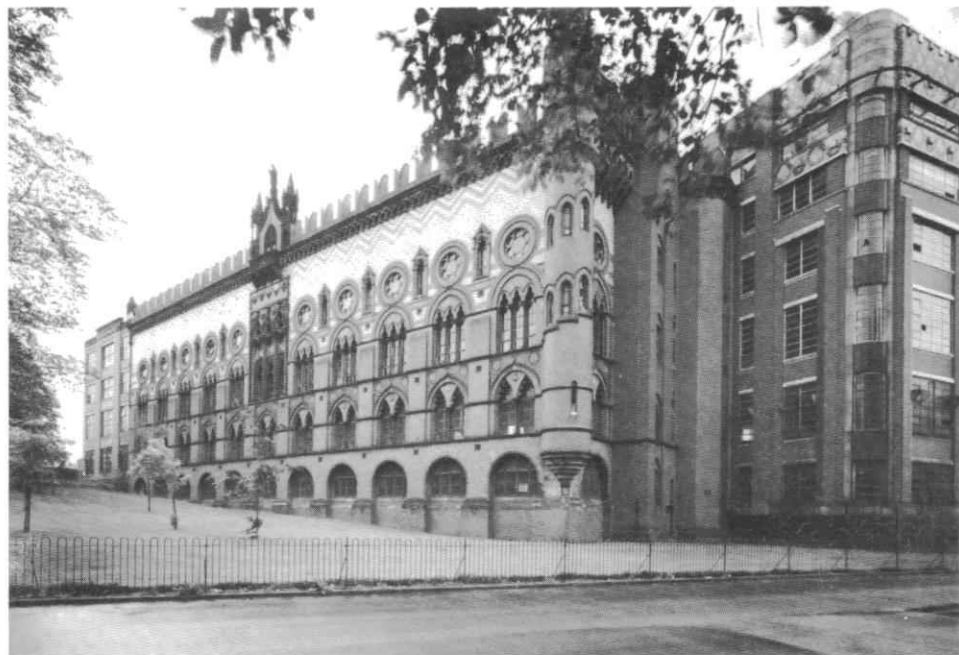
12. **Summerlee Ironworks, Coatbridge** (NS 729655). Situated on the Gartsherrie branch of the Monkland Canal, Summerlee started in 1837. The furnaces were shut down in 1930. As the site is surrounded by railways, including part of the old Monkland and Kirkintilloch of 1826, there was little incentive to redevelop and the greater part of the site remained a blot on the landscape for over 50 years.

Recently work has started on the creation of an Industrial Heritage Park. There is water in the canal again and the foundations of the furnaces and other structures are being excavated. Sparse though the remains of the Summerlee works are, there is more here than survives of any of the other works established in the heyday of the Lanarkshire iron industry.

The only substantial industrial development on the site after the closure of the ironworks in 1930 was the building of the Hydrocon works for the construction of mobile cranes, c1950. Part of the steel-framed building used for this purpose has been renovated and it will form the main exhibition hall for the Heritage Park.

13. **Paton's Bootlace Factory, Johnstone** (NS 423633).. William Paton's business making laces was founded in the mid 19th century. The oldest building on the site dates from 1782 and is a former cotton spinning mill, originally erected for Corse, Burns and Co. It is a six storey rubble building, still in good condition and probably the best preserved 18th century spinning mill building remaining in Scotland.

14. **Cloch Lighthouse, Inverkip** (NS 203758). One of the best known if not the most spectacular of the Scottish lighthouses, the Cloch was built in 1792. The short tower has a corbelled walkway immediately below the lantern, and triangular windows. There appear to be two generations



William Leiper's 'Doges Palace', Templeton's carpet factory, Glasgow. (Crown Copyright, Royal Commission on Ancient Monuments, Scotland).

of keepers' houses, the older now being used as stores.

The Cloch lighthouse marked the northern end of the Clyde shipbuilders' classic trials course, 'running the lights' from the Cloch to Cumbrae.

15. **Ship Model Test Tank, Dumbarton** (NS 402748).

This is a very important survival, indeed it is perhaps the most important relic of the great days of shipbuilding on the Clyde. Constructed in 1882-3 by William Denny and Brothers, it was the first such tank to be built by a commercial shipbuilder anywhere in the world, following the pioneering experimental work of William Froude on model testing.

Denny's Leven shipyard closed in 1962 but fortunately the tank was acquired and operated by Vickers, and subsequently British Shipbuilders, until recently.

It is now preserved, complete with the model-making and testing equipment, by the Irvine-based Scottish Maritime Museum.

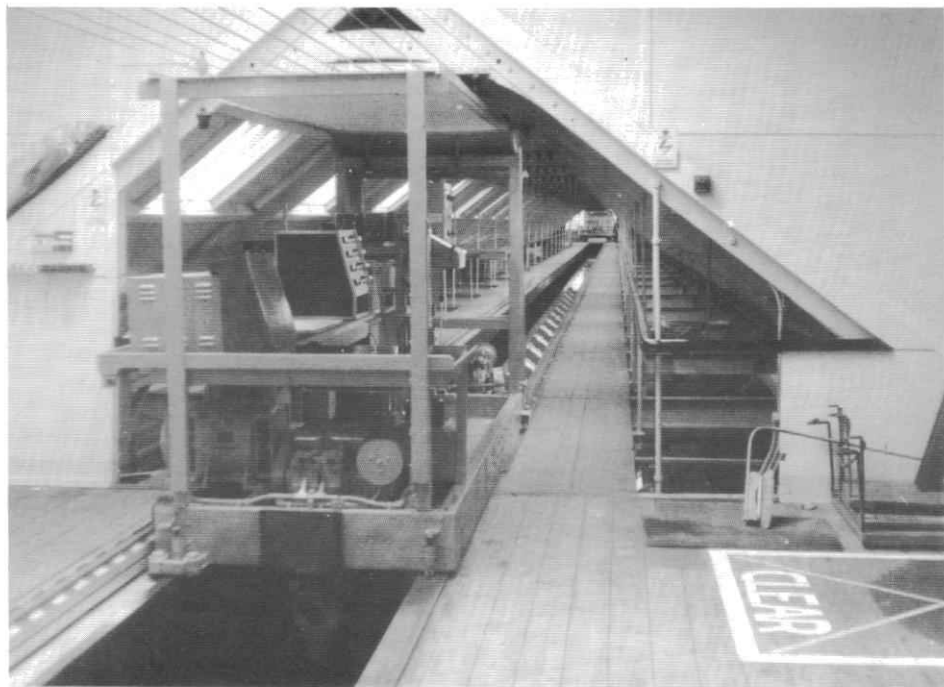
16. **Argyll Motor Works, Alexandria** (NS 390807).

The Argyll was perhaps the best known of the Scottish built motor cars. The first was assembled in 1899 and from 1900 to 1905 they were turned out by the Hozier Engineering Company, Glasgow.

Inspired by the success of this enterprise and taking an optimistic view of the market, Argyll Motors Ltd was set up in 1905 to organize production on a much larger scale. This purpose-built 'palace', possibly the biggest car factory in Europe at the time, was erected. Unfortunately, the promoters' hopes were not justified and the Company had to go into liquidation in 1914.

The building became an Admiralty torpedo factory, a role in which it continued for many years but it is now disused and its future uncertain.

17. **Kelso Bridge** (NT 728336). Designed in 1799 by John Rennie and built between 1801 and 1804 this splendid bridge still carries heavy traffic on the



Denny ship model test tank, Dumbarton, showing the carriage used to tow models under test (J L Wood).

A689 road. The contractors were Murray and Lees and the cost of construction was £12,876.

There are five semi-elliptical arches of 72ft (22m) span. At the north end, the single storey toll house survives.

When Rennie's Waterloo bridge of 1817, in London, was demolished to make way for the present bridge completed in 1945, two of the lamp standards were recovered and mounted on the southern ends of the parapets at Kelso.

18. Union Suspension Bridge, Hutton (NT 934511).

Built in 1820 this was the first large suspension bridge in Britain. The engineer was Captain S Brown. There are three sets of wrought iron link chains to each side and iron rod suspenders. The chains pass over dressed masonry towers, with the one on the English side of the river being built into the hillside.

In 1902-3 the bridge was strengthened by the addition of a wire rope to each of the sets of chains. Additional suspenders of wire rope were

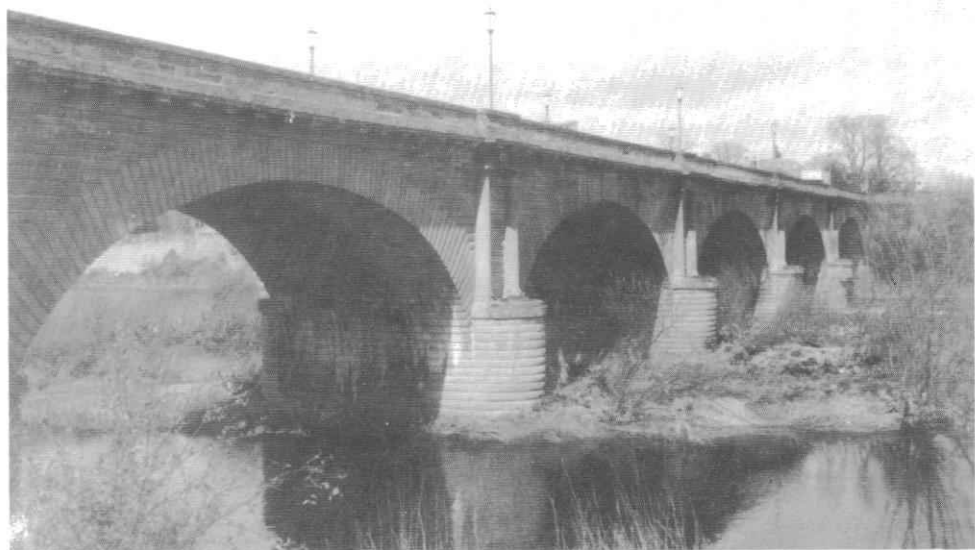
fitted and the deck reinforced. Even so, the maximum weight permitted is only 2 tons. It crosses the River Tweed and is on an unclassified road linking the A698 and the B6461.

19. Preston Mill, East Lothian (NT 595779). This small rubble-built mill, with pantile roof, dates from c1660 and remained in use until 1950. It served the Smeaton estate, grinding oatmeal, wholemeal flour and animal feed. There are two pairs of stones driven by a low-breast water wheel of wood and iron construction.

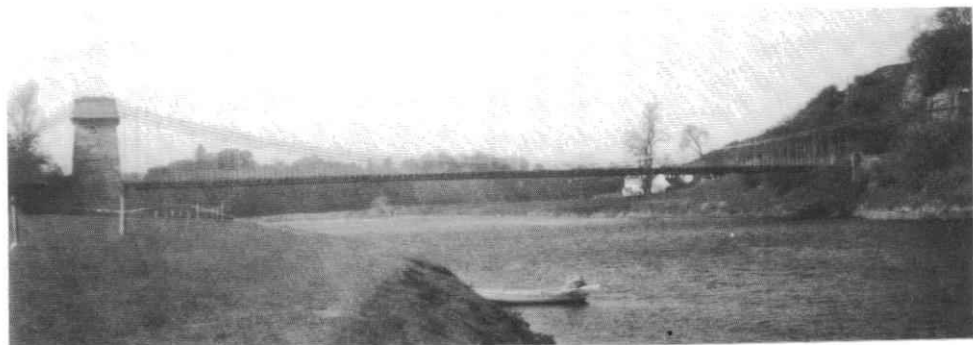
The machinery was restored to working order by the millers Joseph Rank and the mill is now cared for by the National Trust for Scotland.

20. Lady Victoria Colliery, Newtongrange

(NT 333636). Sunk in 1890-94 by the Lothian Coal Company, Lady Victoria closed in 1981 and is now one of the two sites comprising the Scottish Mining Museum. The other site is at Prestongrange Colliery near Prestonpans (see



Rennie's bridge, Kelso (J L Wood).



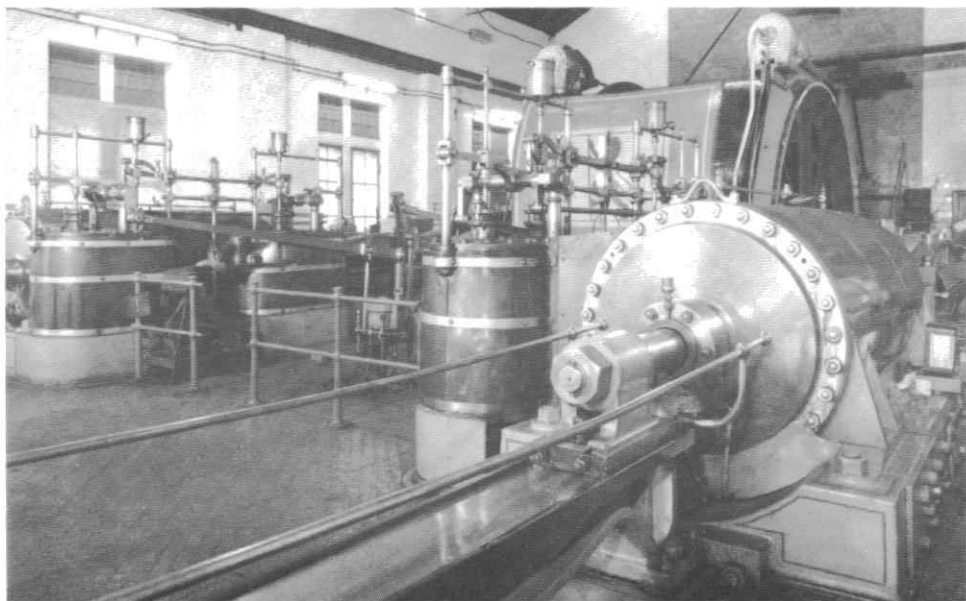
Union suspension bridge, Hutton (J L Wood).

No 21). 'The Lady' represents the high point of the Victorian coal industry in Scotland. Almost all the surface buildings survive and in due course visitor access will be possible to most of the complex. Unfortunately because of geological conditions it has not been possible to retain the underground workings for visitors.

The highlight is the magnificent twin cylinder steam winding engine by Grant Ritchie and Co, Kilmarnock. This has cylinders 42in (1.07m) bore by 84in (2.13m) stroke, with

Cornish-style drop valves, and is probably the largest steam winder ever installed at a Scottish pit. The engine is substantially original but the 75 ton, 20ft (6.1m) diameter drum, installed c1964 by Andrew Barclay, Sons and Co, Kilmarnock, is the fourth. The present braking system put in in 1953 is of the Barclay patent calliper type with the brake cylinders mounted directly on the callipers. They are applied by spring clusters and released by steam pressure.

Seven Lancashire boilers remain, mostly by



Tinker Shenton Ltd, of Hyde and dating from 1915-17. There are loop-type superheaters by Cooper & Greig of Dundee and an economiser (feed-water heater) by E Green and Co, Wakefield.

Near the colliery is Newtongrange village, built at the same time to house miners working at Lady Victoria and other pits in the area.

21. **Cornish Pumping Engine, Prestongrange**

(NT 373736). This is the only complete Cornish pumping engine in Scotland and the only one on a coal mining estate anywhere in Britain. It was erected at Prestongrange Colliery by Harvey and Co, Hayle, Cornwall, in 1874 but incorporated parts of an older engine built by J E Mare and Co, Plymouth, in 1853 for a mine in Devon.

The cylinder is 70in (1.78m) diameter by 12ft (3.65m) stroke and the pump stroke is 10ft (3.05m). New, larger, pumps were installed in 1905 and to cope with the additional load it was necessary to add a truss to the beam. The pumps are in three lifts, the lowest at 806ft (246m) below the surface. At the normal speed of 3½ strokes per minute, pump delivery was about 650 gallons (2955 litres) per minute.

Twice in its working life, in 1916 and 1938, the piston rod broke and the resulting repairs to the cylinder can be seen. The engine stopped

work in 1954 and Prestongrange Colliery closed in 1964. It is now one of the two sites which together form the Scottish Mining Museum. For details of the other site, Lady Victoria Colliery, Newtongrange, see No 20. Among other features remaining at Prestongrange is the power station building which houses historic equipment brought from other collieries.

22. **Dean Bridge, Edinburgh** (NT 243740). The Dean Bridge over the Water of Leith was built in 1829-32 to connect a planned residential development at Dean with the New Town of Edinburgh. The bridge's designer was Thomas Telford, the resident engineer was Charles Atherton and the main contractor was John Gibb. The cost of construction was £18,556.

The bridge, of four-arch dressed masonry construction, is one of Telford's finest and remains virtually as built. The piers and spandrels are hollow. Their interior is kept dry by a layer of concrete, as well as the usual clay seal, in the roadway above — a novel feature at the time of construction.

The bridge is best viewed from the south bank of the river, reached via Bell's Brae and Miller Row. Points to note here are:

1. The direct line and high level of the bridge,

typical of Telford's work.

2. The impression of lightness given by the projecting masonry of the upper arches and of the pilasters on the piers and abutments.
3. The high quality of the Craigleith stone masonry with its close joints.

23. Cable Tramway Power Stations, Edinburgh

From 1888 until 1923, Edinburgh had a public cable-tram system, the largest in the British Isles. Each car was moved by a pair of steel jaws which dangled through the floor and gripped a cable running in a conduit in the road midway between the rails. The cables were hauled by steam engines situated in the system's four power stations. Construction of the system was largely by Dick, Kerr and Co of Kilmarnock and London, who were also the leaseholders.

The present-day Shrubhill Works (NT 263742) of the Lothian Region Transport Department incorporates the second power station to be built, in 1898. When viewed from Dryden Terrace the engine house appears on the left and the boiler house on the right, dominated by an octagonal brick chimney (not to be confused with the chimney of the nearby McDonald Road electricity power station at NT 261752, also built in 1898).

Shrubhill cable power station had two horizontal non-condensing compound engines of 500 hp (373kW) each, one being kept as reserve. The plant, of which nothing now remains, was designed to drive three cables, but one — running around Leith — was never installed because of Leith Corporation's steady opposition to cable-trams.

The original cable-tram depot (now a police garage) and power station (closed 1921) of the system can be seen in Henderson Row (NT 250748). A very short section of tramway has been re-laid in the centre of the west end of Waterloo Place (NT 259741) near the Post Office.

24. Forth Railway and Road Bridges (NT 1379).

The railway bridge is so well-known that it needs hardly any introduction. It was built between 1882 and 1890 for the Forth Bridge Railway Company, a consortium set up by the North British, North Eastern, Great Northern and Midland Railways. Pioneering the use of mild steel (in place of wrought iron) in large structures, it was designed by John Fowler and

Benjamin Baker and built by Tancred, Arrol and Co.

The total length is 8300 ft (2530m) made up of three double cantilevers and dramatically high approach girders. The two main spans are each 1700ft (518m) long.

It is a superb bridge, truly one of the wonders of Victorian times, but the fact that it was built at a cost of 57 lives must not be forgotten.

Proposals for a road crossing of the Forth, by tunnel or bridge, go back at least to the early years of the 19th century but it was not until 1964 that the present elegant suspension bridge designed by Freeman, Fox and Partners, was opened. The main span is 3300ft (1006m).

- 25. Winchburgh Village (NT 0874).** From 1901 the Winchburgh Oil Company built this group of brick cottages to house its shale miners. Most are three roomed but there are some with two rooms.

This is one of the best preserved mining villages surviving in Scotland, a considerable amount of renovation having been carried out in recent years.

- 26. Shale Bings, West Lothian.** The Scottish shale-oil industry was founded in 1851 by James 'Paraffin' Young, eight years before the first oil-well was drilled in America. He began by producing and refining oil from a seam of cannel coal near Bathgate in West Lothian. When reserves of the coal began to give out he turned to the less rich, but far more abundant, local oil-shales. Other shale-oil companies quickly sprang up and the industry eventually employed more than 10,000 workers.

The oil (with ammoniacal liquor) was extracted by heating the shale in retorts. It was then refined to produce a wide range of useful substances including lubricants, solvents, lamp oils, fuel oils and paraffin wax. Peak output was reached in 1910 when enough crude oil to fill just one modern tanker was produced.

In later years, the shale-oil industry survived competition from imported oil by reason of a preferential duty rate, and when this was removed in 1962 shale oil extraction ceased. The refining of imported oil continued and is carried on today at the BP refinery at Grange-mouth. The BMC (later British Leyland) truck factory at Bathgate was steered into the area largely to compensate for the jobs lost in the shale-oil industry.

The only substantial physical remains are the bings of spent shale. Among the more spectacular are those at Addiewell (NT 005628) Broxburn (NT 0873), Pumpherston (NT 0769) and Winchburgh (NT 087747) — all flat-topped, and also at West Calder (NT 010640) — 28. a conical, possibly unfinished, bing. The bings are being eroded as the material is used for bottoming. There are no significant remains of retorts or refineries.

A **Paraffin Young Heritage Trail**, beginning at the BP Information Centre, Grangemouth, connects many of the relevant sites, including the relatively complete mining village of Winchburgh (see No 25).

They are still very much in use. Unfortunately, some of the strengthening necessary to cope with modern loads and speeds has been carried out in a rather unsightly fashion, using old rails.

Edinburgh and Glasgow Union Canal. The Union Canal was built in the years 1818 to 1822, linking Edinburgh with Glasgow via a junction with the Forth and Clyde Canal at Falkirk. Its chief purpose was to ease the transport of coal from West Lothian, Stirlingshire and Lanarkshire into Edinburgh. The engineer was Hugh Baird.

The canal was built on the level apart from at its west end where a flight of eleven locks took



Winchburgh village, with a shale bing in the background (J L Wood).

27. **Edinburgh and Glasgow Railway Viaducts.**

Apart from the descent into Glasgow Queen Street station, the Edinburgh and Glasgow Railway was built virtually level throughout. There was a price to be paid for this in major civil engineering works. Among these is the stupendous viaduct over the River Almond (NT 113722). This has 36 arches of 50ft (15.2m) span.

Near Linlithgow is the River Avon viaduct with 23 arches. Both viaducts were built for the opening of the line in 1842. John Miller, of Grainger and Miller, was the engineer.

it down to the Forth and Clyde Canal. In 1933 the locks were filled in, making serious navigation along the canal impossible. Some of the most interesting and spectacular of its remaining features can be seen in the Stirlingshire stretch (NS 956758 to 865794).

A walk might begin at Woodcockdale in West Lothian where a set of two-storey stables can be seen (NS 975759). Further west, at NS 967758 a twelve-arch aqueduct straddles the river Avon, its cast iron trough supported on masonry piers. At the west end of the aqueduct there is a small drydock (NS 965785) and, beside the



The Avon aqueduct on the Edinburgh and Glasgow Union Canal (Crown Copyright, Royal Commission on Ancient Monuments, Scotland).

towpath, a milestone and another stone marking the boundary between the third and fourth stages of the journey from Edinburgh to Falkirk. At NS 962762, there is a transhipment basin where the Slamannan Railway, completed in 1840, terminated.

At NS 884784 to NS 881790, Scotland's only surviving canal tunnel burrows beneath the Glen Village area.

The standard overbridges are segmental-arched, numbered on their keystones and occasionally bearing decorations, such as the smiling and grimacing faces on the 'Laughin' and Greetin' (weeping) Bridge' at Glen Village.

29. **Hayford Mills, Stirling** (NS 776928). This large and interesting complex consists of a series of buildings ranging from one to six storeys, mainly of red and white brick. Built as a textile mill c1860 it is now used as a Government storage depot.
30. **Stirling Bridges.** (NS 797945). The old bridge, dating from the late 15th or early 16th century, is a particularly fine example. There are four semi-circular arches with dressed masonry arch rings. It is now used only as a footbridge and is a Guardianship Ancient Monument.

Alongside is Robert Stevenson's new bridge of 1831, of 'rustic' masonry construction, with five arches.

31. **Alloa Wagon-Way.** Many horse wagon-way systems were built in the 18th century to convey coal from pits to navigable water. Most of those in Scotland fed harbours on the River Forth and among the most extensive was that leading to Alloa, from pits around the villages of Sauchie and Fishcross.

The first section was built c1766, originally with wooden rails, and the network grew as new pits were sunk in the 19th century. It remained in operation until the early 1920s by which time it is thought locomotive haulage was used. At least some of the rails were not lifted until World War II.

The routes are easily traced in many places. In Alloa itself the line of the wagon-way is now a footpath. The most interesting features remaining are two substantial rubble-built bridges (NS 884927 and 886929) carrying main roads over the waggon-way.

32. **Glass Cone, Alloa Glassworks** (NS 881923). This old established glassworks, now operated by United Glass Containers Ltd was founded in the



Route of the Alloa wagon-way through the town (J L Wood).

mid 18th century. It has been rebuilt many times and the buildings and plant are mostly modern. However, still on the site is the only remaining glass cone in Scotland, believed to date from around 1825. The cone is of brick, on a stone base.

It is Category A listed building and a scheduled Ancient Monument.

33. **Devon Colliery Engine House, Fishcross** (NS 898958). Scottish-built Cornish engines were few and far between and the only remnant is on this site. The engine was built c1860 by Neilson and Co, Glasgow, but unfortunately only the beam remains in the engine house.

The house is of ashlar construction, with a hipped roof. Restoration of the building was carried out by Central Regional Council. It is now a scheduled Ancient Monument.

34. **Strude Mill, Alva** (NS 887975). The towns at the foot of the Ochil Hills have a long history of textile manufacturing and, although less important than it was, the industry is still significant.

Of the surviving mills the most impressive is the Strude Mill, a handsome building in a very dramatic setting with the hills as a backdrop.

Built around 1827, probably to house hand looms, the mill has six storeys plus an attic. The south elevation has a pediment and bellcote. What remains was once part of a larger complex.

Woollen manufacture continued until the mid 1960s. Thereafter it became a warehouse for a time and is now disused. However, the future of this Category B listed building seems reasonably assured. Planning permission has been granted for conversion into 35 dwellings but work had not started at the time of writing.

35. **Clock Mill, Tillicoultry** (NS 914974). The Clock Mill (so called because of the clock on the south gable) was built in 1824 as a water powered carding and spinning mill. It is of rubble masonry, with three storeys plus an attic.

When it finally closed c1980 it was in use as a weaving mill. After closure it was bought by Central Regional Council and restored under a



Neilson pumping engine, Devon Colliery (J L Wood).

Manpower Services Commission programme. Part of the building is in use as a Tourist Information Centre and it is hoped that the remainder will be developed as a local interpretation centre, dealing with the textile industry in particular.

36. **Wooden Dam, Tillicoultry (NS 912978).** The Clock Mill (No 35) was one of several 19th century mills in Tillicoultry which depended on an elaborate water supply system for their power. Part of the lade system can be traced but the most interesting relic of the system is a massive timber dam in Mill Glen. This was built in 1857 to replace an older dam further downstream. Although much reduced in height it still impounds a substantial volume of silt.

forced concrete bridge started early in 1934 and it was opened to traffic on 29 October 1936. The engineers were Alexander Gibb and Partners, Westminster and the contractor was the Cleveland Bridge and Engineering Company, Darlington.

Total length of the bridge is 2696 ft (822m) and it incorporates a 364ft (111m) electrically-operated swing span weighing 1600 tons. At the time of construction it was the longest swing span in Britain and this is probably still the case. When open, there are two 150ft (45.7m) wide passages for ships. Vessels of up to 4000 tons can be accommodated. There is now very little river traffic, but when the bridge was being constructed some 30 ships a month passed the site.

37. **Road Bridge, Kincardine-on-Forth (NS 921869 - 928873).** Construction of this steel and rein-
38. **Group of Limekilns, Charlestown (NT 065835).** This range of 14 kilns, dating from 1761 onwards,



The Strude mill, Alva, with the Ochil Hills in the background (Crown Copyright, Royal Commission on Ancient Monuments, Scotland).

is the largest group in Scotland. They were served by Charlestown harbour, the Elgin Railway (a horse wagon-way) and, later, a branch of the North British Railway.

39. **St. Leonard's Works, Dunfermline** (NT 097867). This fine three storey Italian Renaissance building, which was formerly the office block of Erskine, Beveridge and Company's St Leonards Works, has recently been converted into dwelling houses.

The firm continues production of table linen, towels etc on Northrop automatic looms with Jacquard mechanisms.

40. **Ladybank Railway Station** (NO 307097). This particularly attractive station was built for the opening of the Edinburgh and Northern Railway, in 1847-8, from Burntisland to Ferryport-on-Craig, now called Tayport. It made possible

a reasonably direct journey from Edinburgh to Dundee, albeit using three different railways, plus ferries from Granton to Burntisland and from Tayport to Broughty Ferry.

The Edinburgh and Northern workshop building at Ladybank also survives and indeed until the replacement of the semaphore signalling by colour lights a few years ago the whole station area had quite a period flavour.

Other stations on the Edinburgh and Northern are also noteworthy, particularly Burntisland (NT 233857) and Cupar (NO 377143).

41. **Glenruthven Weaving Mill, Auchterarder** (NN 955129). Built in 1877, with later additions, the mill originally wove cotton goods. In later years wool and synthetics were also woven. When full scale production ceased in 1980 it



Wooden dam, Tillicoultry (J L Wood).

was the last factory in Scotland powered by a steam engine and line-shafting.

The engine is a slide-valve tandem compound of about 65hp (87kW). This is probably around the same date as the mill, but in fact came to Glenruthven second hand c1919. There is a Cornish boiler built in 1949 by Penman and Company, Glasgow, as a replacement for the original which is believed to have been of a similar pattern. Some of the textile machinery remains, including looms by the Anderston Foundry Company, Glasgow, and George Hattersley of Keighley.

Part of the building is now in use for other manufacturing purposes, but a portion, which includes the engine and boiler houses, is being developed as a local museum by the Auchterarder Heritage Trust. It is open daily in summer and the engine is steamed regularly.

42. **Perth Waterworks** (NO 120232). Built in 1832 to the design of Adam Anderson this is a curious circular classical building surmounted by a domed cast iron water tank, together with a rectangular block in the same style and an ornate chimney. It was restored and converted into a tourist information centre c1970.

This exercise might have been classed as enlightened conservation but for the fact that it resulted in the needless destruction of an early 20th century extension, housing the last surviving example of a steam pumping engine in a Scottish waterworks. This was a vertical triple expansion engine by Douglas and Grant, of Kirkcaldy.

43. **Old Bridge, Perth** (NO 121239). This attractive bridge over the River Tay was built to the design of John Smeaton in 1766-72. It has nine arches with dressed masonry arch rings and rubble spandrels.

In 1869 cast iron footpaths were bracketted out on both sides in order to increase the width of the carriageway. A D Stewart was the engineer for this work.

44. **Stanley Mills** (NO 114328). Built as a water-powered cotton spinning mill, this was one of the many such enterprises in which Richard Arkwright had an interest. The main buildings are a multi-storey group arranged in a U-shape; the Bell Mill (1790), the East Mill (c1840) and linking the other two, the Mid-Mill (as rebuilt c1850 following a fire). There are numerous other one and two-storey buildings in the complex, including an attractive circular gate-house with ogee roof, dating from c1876.

Synthetic yarns are now produced, using modern machinery, but a complete set of preparing and spinning machinery for cotton still exists. This dates from the 1920s and has not been used for some years.

The nearby village of Stanley, built in the late 18th and early 19th century to house the mill workers, is also of interest.

45. **Linen Factory, Spittalfield** (NO 108409). Known as the 'muckle hoose' (big house) this two-storey and attic block was erected in 1767 as a linen weaving factory. It would, of course, have housed hand looms as the power loom was not developed until many years later. The building has long since been converted into dwelling houses.

46. **Tay Railway Bridge** (NO 397263 - 392293). The first Tay Bridge, completed in 1878 to the designs of Thomas Bouch, was partly blown down by a gale on 28 December 1879. Construction of a replacement started soon afterwards,

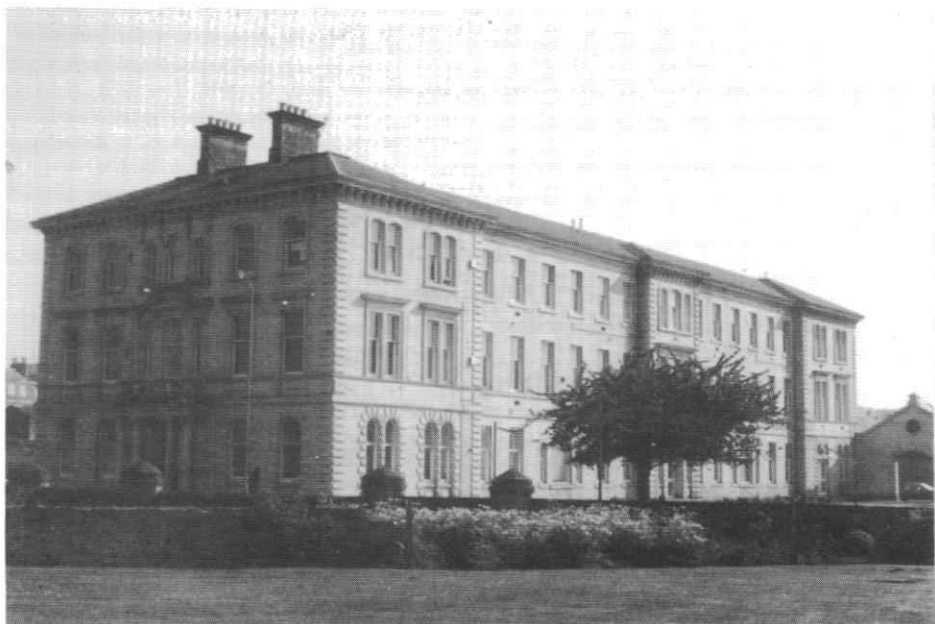


Swing-bridge, Kincardine-on-Forth (J L Wood).

for even in its brief life its value to the North British Railway had become clear. The present bridge, designed by W H and Crawford Barlow, was completed in 1887.

A much more substantial structure, it consists of wrought iron trusses on piers built of rivetted plate, resting on brick foundations. Some girders from the old bridge were re-used and the stumps of the old piers remain visible downstream.

47. **Newtyle Railway Station** (NO 300413). The Dundee and Newtyle Railway was opened late in 1831. Its 11.5 mile (18km) route included three stationary engine-worked inclines, the trains being horse-drawn elsewhere. The first locomotives were introduced in 1833 but it was not until the 1860s that the inclines were bypassed, thus allowing locomotive haulage through-out. In 1955 the line was closed completely.



Former office block, St Leonard's works, Dunfermline (J L Wood).



Ladybank station, Edinburgh and Northern Railway (Crown Copyright, Royal Commission on Ancient Monuments, Scotland).

At Newtyle there remains a large rubble masonry train shed with elliptical arched entrances. The date of this is uncertain but it may be the second station on the site, built shortly after the line was leased by the Dundee and Perth Railway in 1846.

To the south of the station, the route of the 1 in 13 Hatton incline up the north face of the Sidlaw hills can be seen.

48. **Boddin Limekilns and Ice-House, Nr Montrose** (NO 719594). Dating from the middle of the 18th century this impressive group of large kilns was built by Robert Scott of Duninald. As they are built on a promontory, the best view of them is probably from a boat! Unfortunately the promontory is suffering from erosion.

Nearby is an ice-house probably of rather later date than the kilns. This takes the form of a vaulted chamber built into a hillside, with an abutting two-storey stone building.

49. **Dumbarrow Windmill, Nr Letham** (NO 549471). The remains of some 60 windmills have been

identified in Scotland but there is not a single complete example. Among the more impressive stumps remaining is that of Dumbarrow, an early 19th century threshing mill. The 50 ft (15m) rubble tower has a flagstone walkway about halfway up, presumably for access to the sails.

Single Cylinder Beam Engine, Garlogie (NJ 782055). Believed to have been built between 1830 and 1840, this is the only beam mill engine remaining in situ in Scotland. It drove a woollen spinning mill until 1904. The mill itself was demolished in 1934 but miraculously, the engine house and 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. The cylinder has a bore of about 16in (0.41m) and a stroke of 50in (1.27m). While the power output is a matter for some doubt, a figure of about 50hp (37kW) seems reasonable for an engine of this size and date.



Glenruthven weaving mill, Auchterarder (G Hayes).

In an adjoining building there is an attractive hydro-electric plant built in 1923 to supply power to the Dunecht estate. This consists of a 100hp (75kW) horizontal-shaft Francis turbine by Escher Wyss, of Zurich, coupled to an English Electric Company generator.

51. **Girdleness Lighthouse, Aberdeen** (NJ 962053).

The tower at Girdleness is unusual because it has two lanterns. In addition to the normal one at the top there is another just short of half way up the tower. The lower one has been disused for many years.

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 Robert Louis Stevenson, the author.

52. **Craigellachie Bridge** (NJ 285452). A Telford masterpiece, Craigellachie is one of the finest cast iron bridges in Britain. It was completed in 1815 and still carries traffic across the River Spey. The single span of 150ft (45.7m) has four

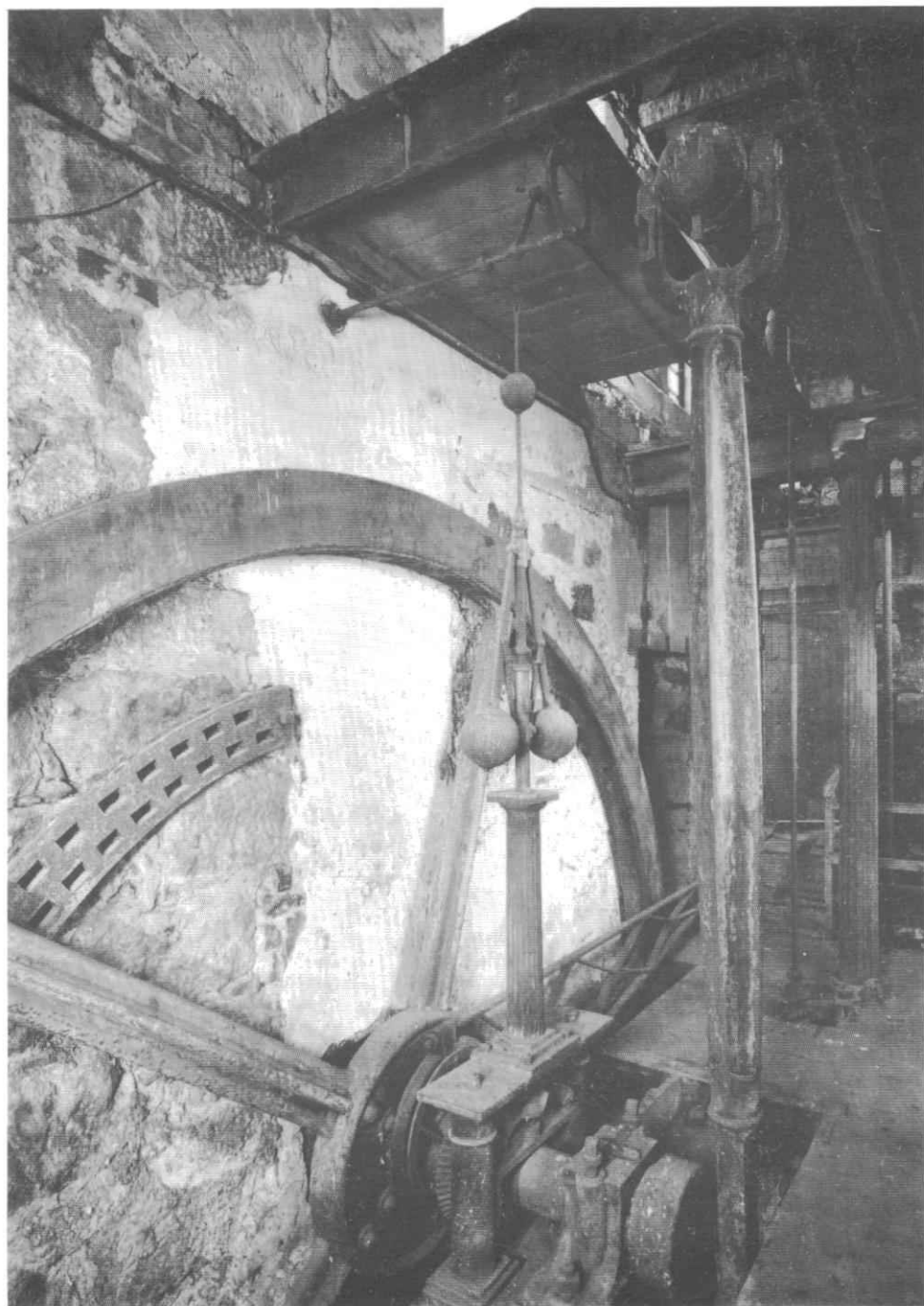
ribs, supported by rustic masonry abutments. Each rib, which is of lattice form, is cast in seven sections.

On the Banff side, there are iron plaques with the legends 'Cast at Plas Kynaston Ruabon Denbeighshire' and '1814'.

53. **Caledonian Canal** (NN 096767 — NH 644467).

The Caledonian Canal was built to improve communications and employment opportunities for the Highlanders and to enable sea-going vessels to avoid the dangerous passage through the Pentland Firth. Constructed in 1804-22, with much rebuilding after that, it passes through the Great Glen between Corpach and Inverness, making use of Lochs Lochy, Oich, Ness and Dochfour. The principal engineer was Thomas Telford with William Jessop as consulting engineer.

The Canal was never commercially successful but is still used, principally by small coastal craft, fishing vessels and leisure craft. It can pass craft measuring up to 160ft x 36ft x 13ft 6in draught (48.4m x 11.0m x 4.1m) through its 29 locks.



Single cylinder beam engine, Garlogie (Crown Copyright, Royal Commission on Ancient Monuments, Scotland).

Things to see, from Corpach to Inverness

1. Entrance locks at Corpach (NN 096767).
 2. Railway swing bridge at Banavie (NN 112768), opened in 1901 to carry the West Highland Extension Railway over the Canal. A massive steel bow truss swing bridge, hand-operated. Engineers: Simpson and Wilson.
 3. 'Neptune's Staircase' (an eight-lock staircase) at Banavie (NN 114770).
 4. Aqueducts at Mount Alexander (NN 122777), Torcastle (NN 132792) and Glenloy (NN 149818).
 5. Cast iron swing bridge at Moy (NN 162826), the last survivor of the original swing bridges.
 6. Five-lock staircase at Fort Augustus (NH 378092).
 7. Stump of an engine-house at Fort Augustus (NH 378091) used for draining the lock chambers during construction.
 8. Lighthouse at Lochend (NH 602377) with an octagonal end, similar to that of a tollhouse.
 9. Four-lock staircase at Muirtown (NH 653456).
 10. Railway swing bridge at Clachnaharry (NH 648466) rebuilt in 1909 for the Highland Railway, replacing the original bridge of 1862. This is hand-operated and protected by railway and canal signals controlled from a standard Highland Railway signal box.
 11. Entrance locks at Clachnaharry (NH 644467).
54. **Slate Quarries, Ballachulish** (NN 085583). Working of slate started c1694 and ceased in 1955. In the late 1970s the Scottish Development Agency undertook a Land Renewal Scheme in the area, but the terraced workings are still clearly visible. There is an inclined plane built of slate rubble, with an arch over the former main road.
55. **Glenfinnan Railway Viaduct** (NM 910813). The 39 mile (62km) extension of the West Highland Railway to Mallaig was opened in 1901. Simpson and Wilson of Glasgow were the engineers and Robert McAlpine and Sons, also of Glasgow, the contractors. Robert McAlpine was known as 'Concrete Bob' because of his enthusiasm for mass concrete and on the Mallaig line he was given ample opportunity to work with the material.
- There are many concrete bridges on the line, including one of 127ft 6in (38.9m) span at Borrodale Burn (NM 698855). However, the finest is the curved 21-arch Glenfinnan Viaduct

which is 1248ft (380m) long and 100ft (30.5m) above the bottom of the Finnan Valley.

56. **Connel Bridge** (NM 911343 - 911347). The 28-mile (45km) branch of the Callander and Oban Railway from Connel Ferry to Ballachulish was opened in August 1903. Across the mouth of Loch Etive was built this steel cantilever bridge giving a 500ft (152m) clear waterway. It was reputed to be the longest cantilever in Europe, after the Forth Bridge.

The steelwork contractor was Arrol's Bridge and Roofing Company, Glasgow.

The Ballachulish branch closed in 1966 but the bridge remains in use as a road bridge. Even when the trains were still running the sparse service allowed use by road vehicles on payment of a toll.

57. **Bonawe Ironworks** (NN 009318). There are remains of several early charcoal ironworks in the Scottish Highlands. Of these Bonawe is the best preserved and had the longest working life. Now it is probably the most important monument to this phase of the iron industry in Britain.

The works was established in 1752 by a company based in the Furness district of what is now Cumbria. Bonawe had an ample supply of the essential commodity which was becoming scarce elsewhere, timber for making charcoal.

Surviving on the site is the furnace itself, substantially complete but lacking part of the lining, the bridgehouse from which the furnace was charged, and charcoal and ore sheds. Fragments of the house for the water powered bellows also remain. The lintels above the tap hole and tuyere arch of the furnace are of cast iron. The works last operated in 1876. It is now a Guardianship Ancient Monument.

58. **Crinan Canal** (NR 853853 - 788943). This is a sea-to-sea canal, approximately 9 miles (14km) long, which crosses the Knapdale and Kintyre peninsula from Ardrishaig on the east side to Crinan on the west. It was built to avoid the dangerous voyage around the Mull of Kintyre and to improve commerce between north west Scotland and the Western Isles on the one side and Loch Fyne and the Firth of Clyde on the other. Henry Bell's **Comet** was a regular user as were other passenger vessels, fishing boats and



Charcoal blast furnace, Bonawe ironworks (Crown Copyright, Historic Buildings and Monuments).

cargo-carrying 'puffers'. Today it is mainly the preserve of yachtsmen.

The canal was built in 1794 to 1809. John Rennie was the consulting engineer and John Paterson the resident engineer. In 1817 it was extensively repaired by John Gibb, following recommendations made by Thomas Telford. Of variable breadth, it can pass vessels up to 88ft (26.8m long) by 20ft (6.1m) beam, with a maximum draught of 9.5ft (2.9m).

The canal's length can be driven or walked. Features of note include the four groups of locks: four at Ardrishaig, four at Cairnbaan, five at Dunardry and two at Crinan. Of the opening bridges, those at Ardrishaig (NR 854853) and Cairnbaan (NR 839908) date from the 1930s, while those at Bellanoch (NR 803923), near Crinan (NR 793938) and at Lochgilphead (NR 857879) were built in the 1870s, the last-named being by P & W McLellan, Glasgow (1871). The cantilever bridge at Dunardry (NR 820912) rolls on rails and is moved by hand-gearing.

The Crinan end is the narrowest part as it had to be blasted and chiselled through solid

rock. At 'Propeller Corner', before lock 14, 15 tons of propellers were found when the canal was drained a century ago.

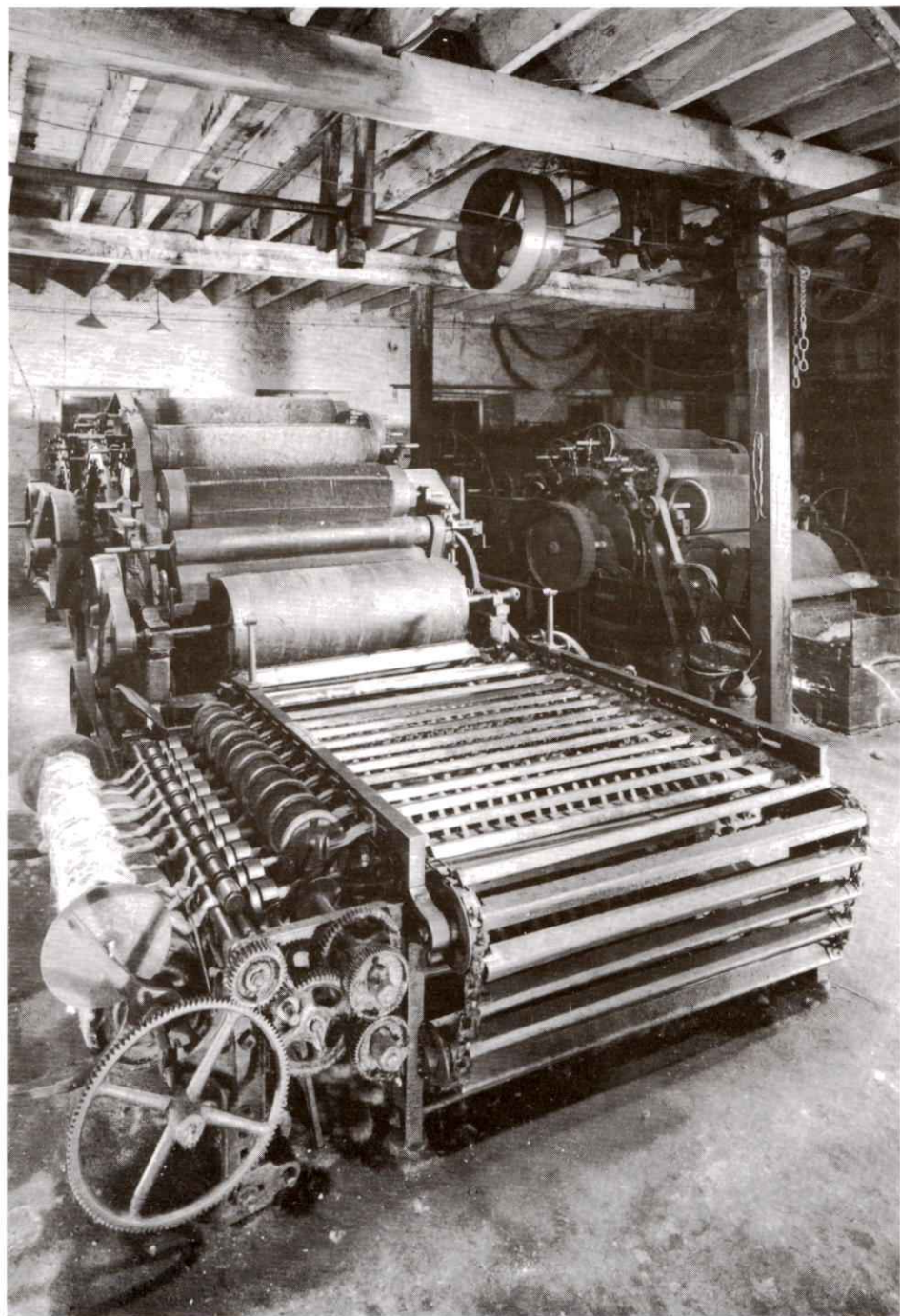
59. **Bridgend Woollen Mill, Islay** (NR 351632). This mill is a rather nondescript rubble building of two storeys plus attic, with a single storey wing.

The main interest of the site lies in the surviving machinery including spinning jennies and a very rare piecing machine, by Robert Archibald of Devonvale, which may be the only example of such a machine in Britain, apart from one or two in museums. It dates from the period when carding machines delivered a series of short lengths or slivers of wool instead of a continuous 'rope'. These slivers were joined manually at first by 'piecers', usually children, and later by piecing machines such as the one here.

Power came from a 12ft (3.66m) diameter internal water wheel, which is a replacement dating from 1928. The present building dates from 1883 but nearby is the remains of a late 18th or early 19th century mill and it seems likely that some of the old machinery came from this.

The mill was in full production until c1963 and weaving only has continued since.

Carding engines and piecing machine, Bridgend woollen mill, Islay (Crown Copyright, Royal Commission on Ancient Monuments, Scotland).





Interior of 'click-mill', Dounby, Orkney (Crown Copyright, Historic Buildings and Monuments).

60. 'Click' Mill, Dounby, Orkney (HY 325228).

Dounby mill is of the vertical shaft or norse type and is the only one remaining in Orkney. There are several others in the Shetlands.

The building dates from c1825 and is of flagstone, with a flagstone roof covered in turf.

Unusually, the tirl (wheel or runner) has two rows of blades, each with six blades. The drive to the stones is direct, without any intermediate gearing.

It is now a Guardianship Ancient Monument.

AIA Bulletin Extra

This booklet is published by the Association for Industrial Archaeology, in conjunction with the Scottish Industrial Heritage Society, on the occasion of the AIA Annual Conference at Glasgow in September 1985. It gives brief details of only a few of the most important industrial archaeological sites in Scotland.

The SIHS was formed in 1984 by the amalgamation of two long established bodies, the Scottish Society for Industrial Archaeology and the Scottish Society for the Preservation of Historical Machinery. It exists to encourage the study of all aspects of the industrial history of Scotland. In conjunction with the Business Archives Council, the journal **Scottish Industrial**

History is produced and in addition there is a regular SIHS **Newsletter**.

If you would like more information write to the Society, c/o Dept of Technology, National Museums of Scotland, Chambers Street, Edinburgh EH1 1JF.

Nationally, industrial archaeology is represented by the **AIA** which publishes *IA Review* twice yearly, *AIA Bulletin* four times each year, *World Industrial History* annually and Booklists, Swapshop and a calendar, from time to time. The Association also represents local and national 'interests' at public and planning inquiries, and plays a large part in the formation of opinion on conservation issues.

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