



**Industrial Archaeology in Scotland: Future Perspectives** Edinburgh, Saturday 20<sup>th</sup> October 2007

**Roland A Paxton (Heriot Watt University):** 'Identifying Scotland's Most Important Civil Engineering Works'

Categories: Transport [Maritime, Roads, Railways]; Public Health; Power

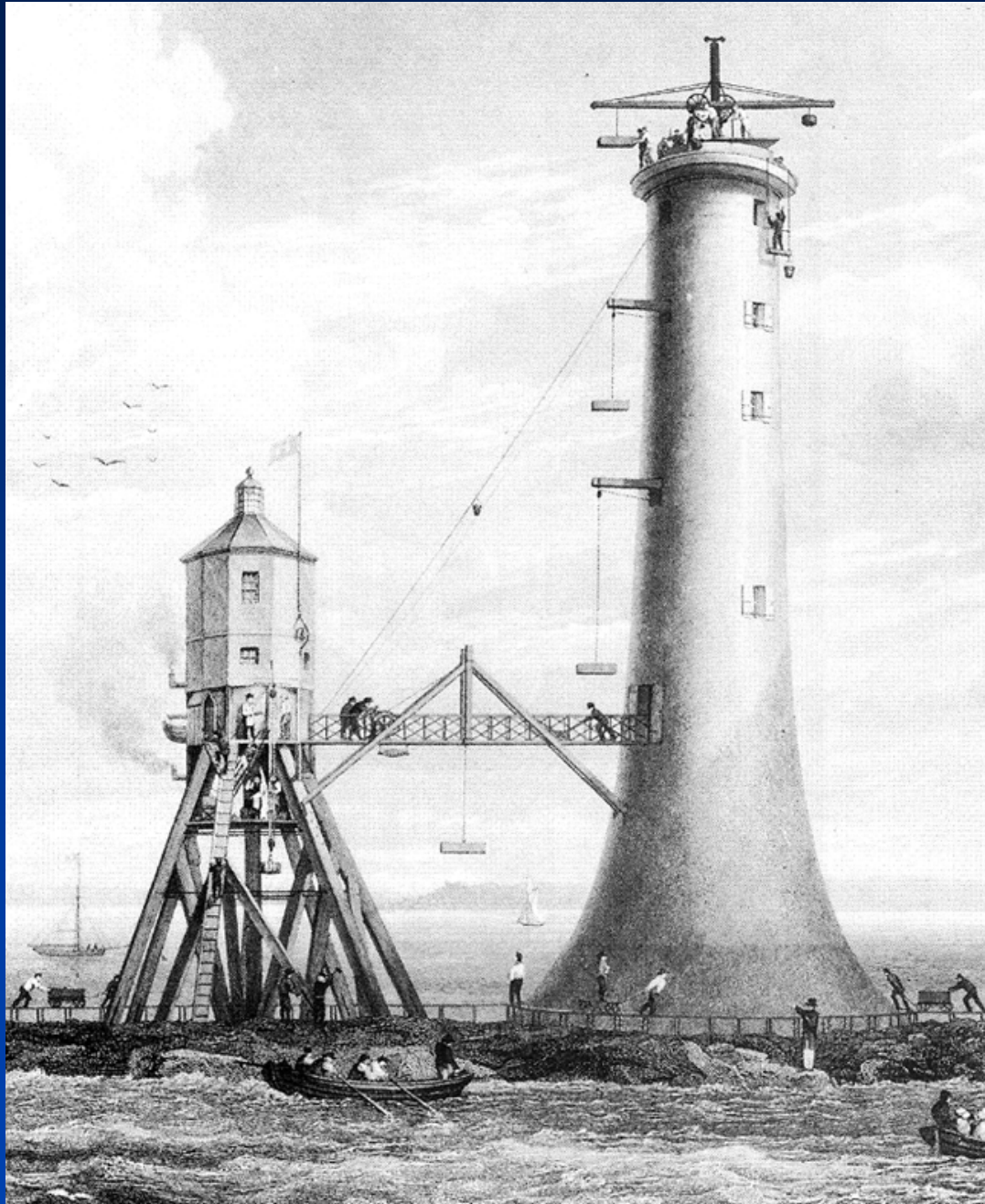




Charlestown Harbour and Limekilns 1761-90

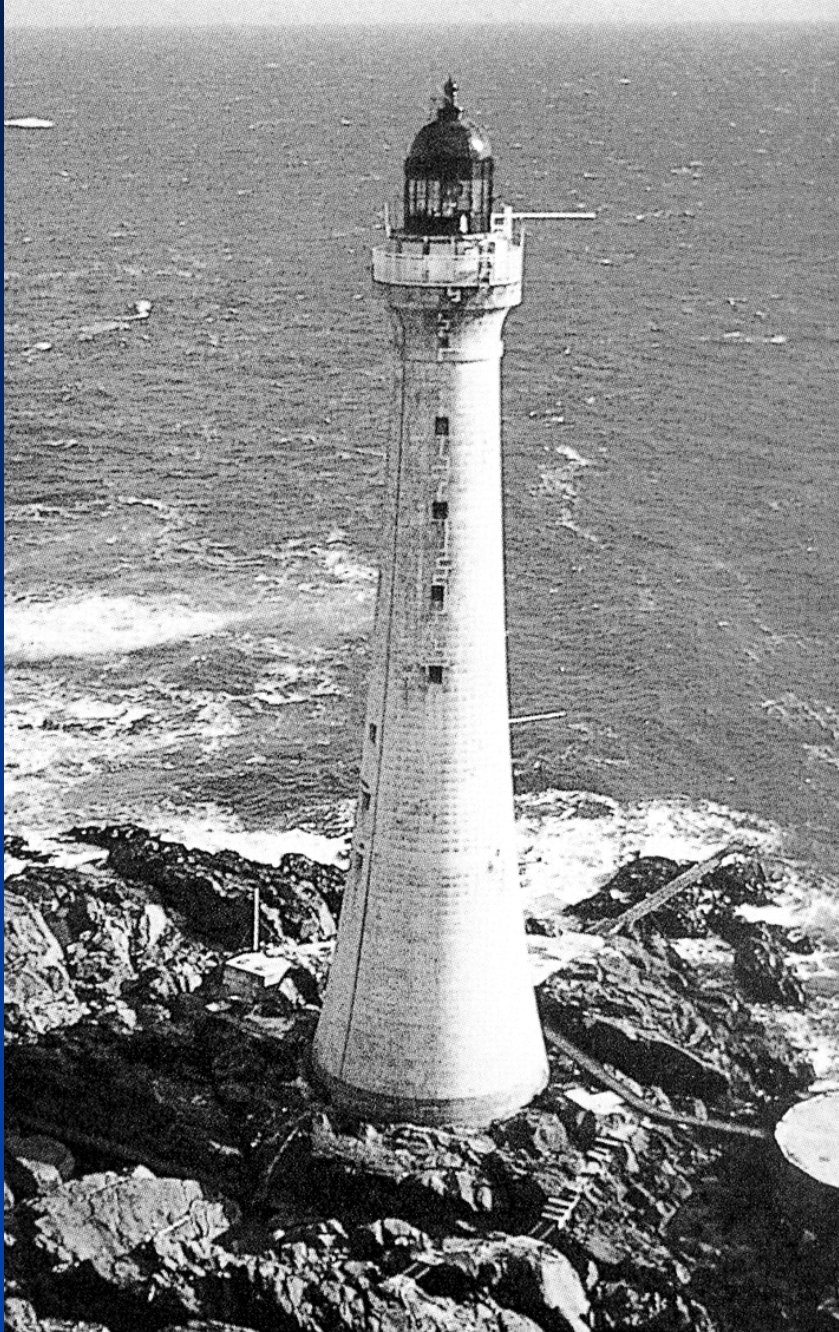


North Ronaldsay Lighthouses 1789, 1809:1852 (brick 138 ft)



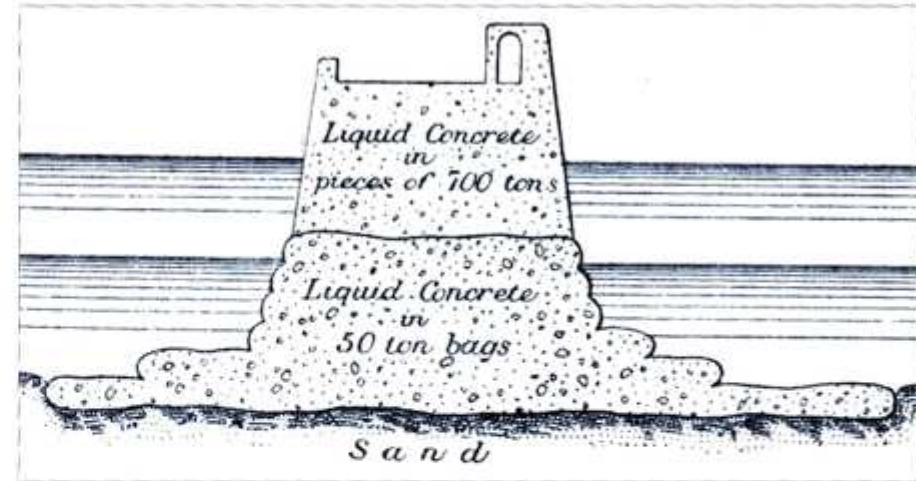
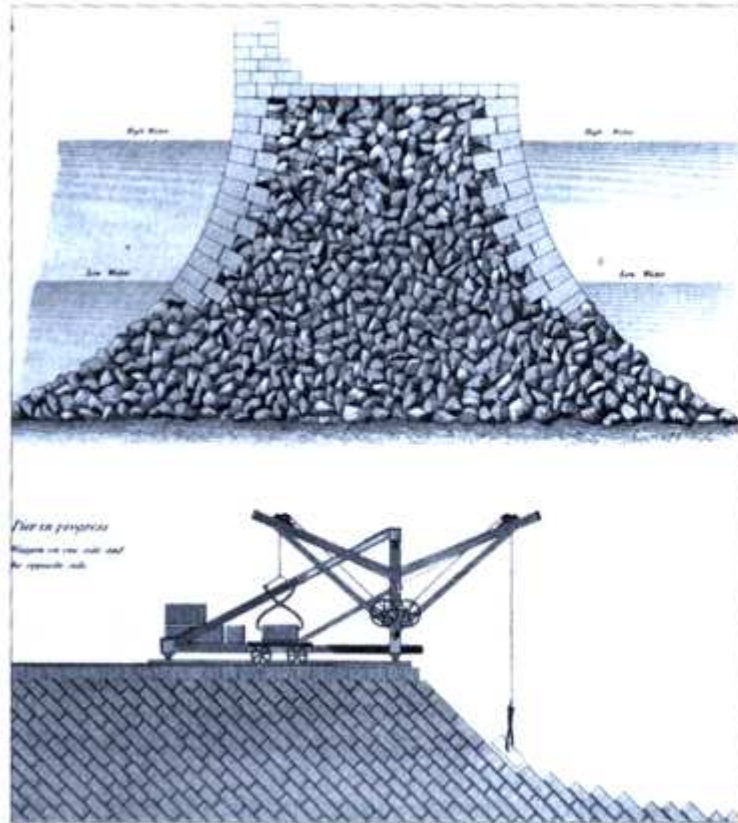
## Bell Rock Lighthouse Works 1810

One of the world's  
greatest maritime  
engineering  
achievements

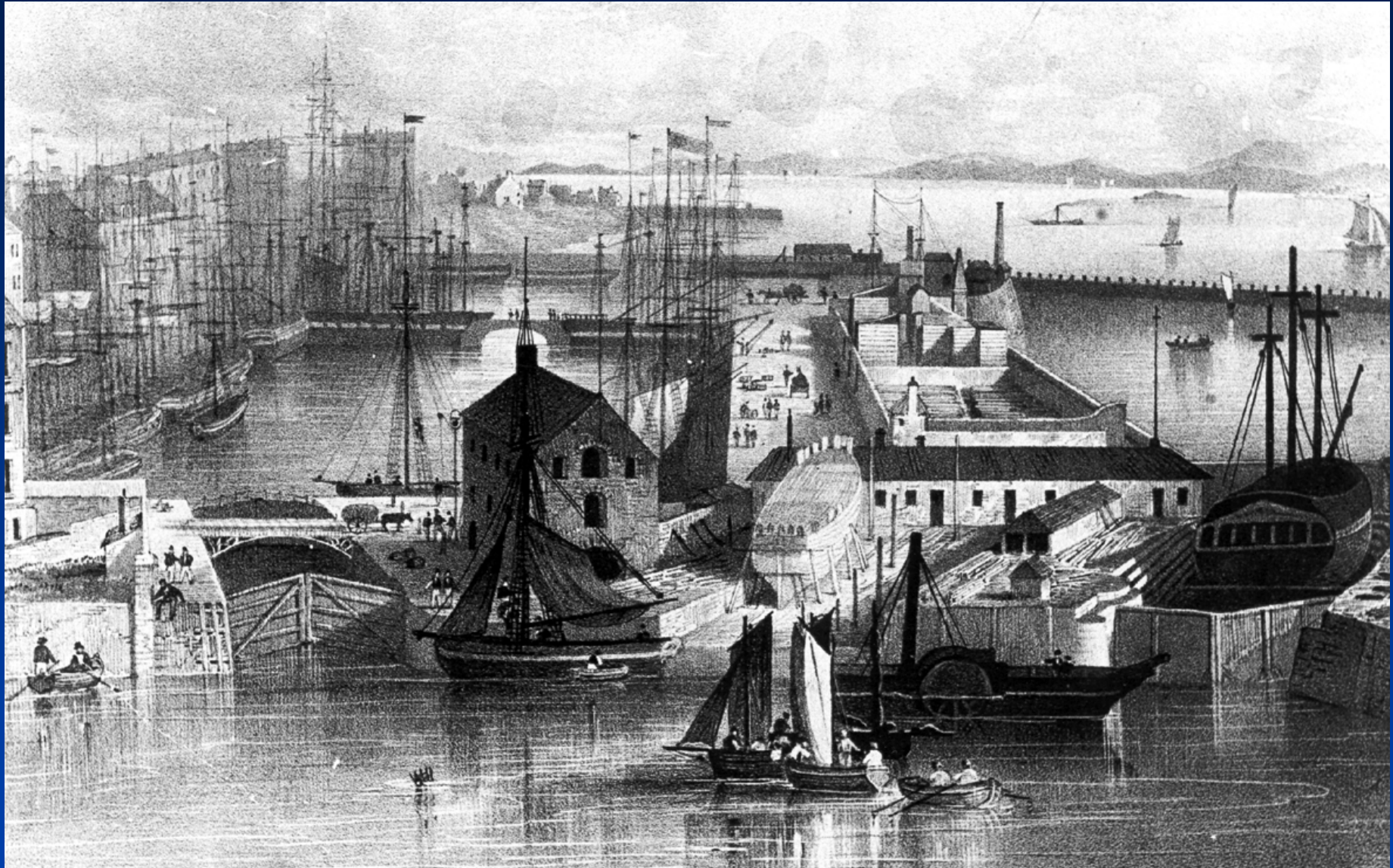


## Skerryvore Lighthouse 1844

A landmark in scientific design for mass combined with elegance of outline

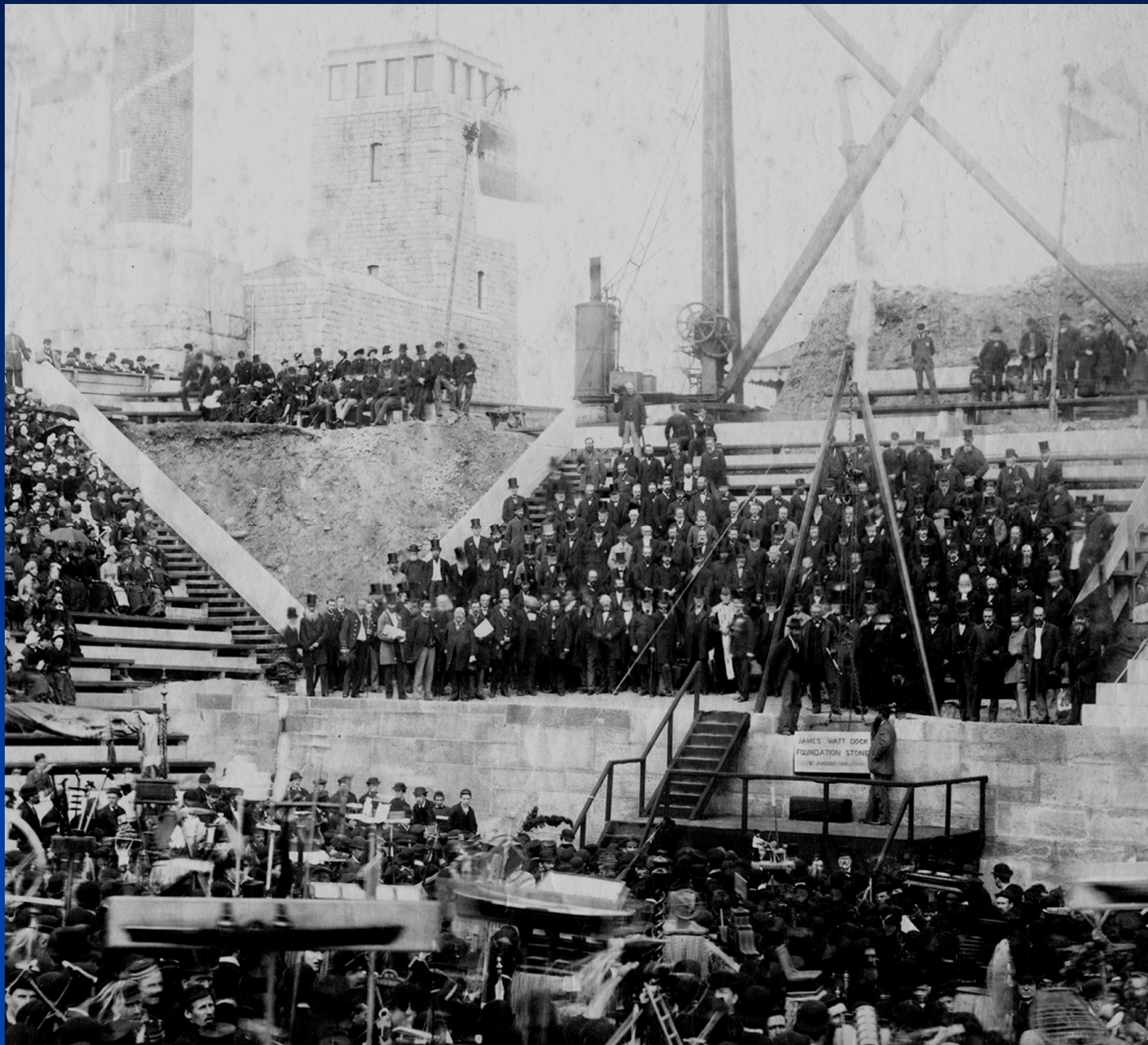


Aberdeen Harbour, North Pier 1816 and 1877 concrete extension



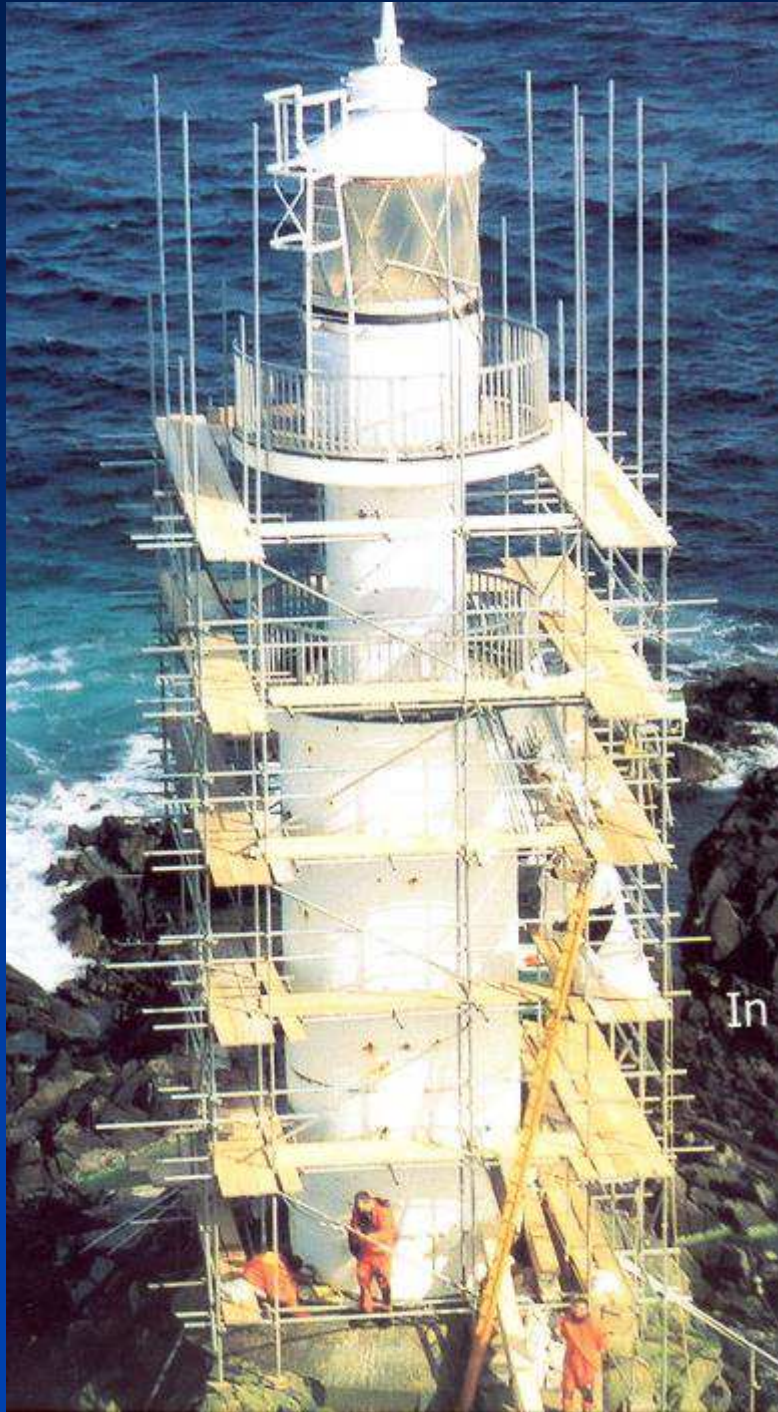
Leith Harbour 1838





Greenock,  
James Watt  
Dock 1881  
(3000 ft x 400 ft)

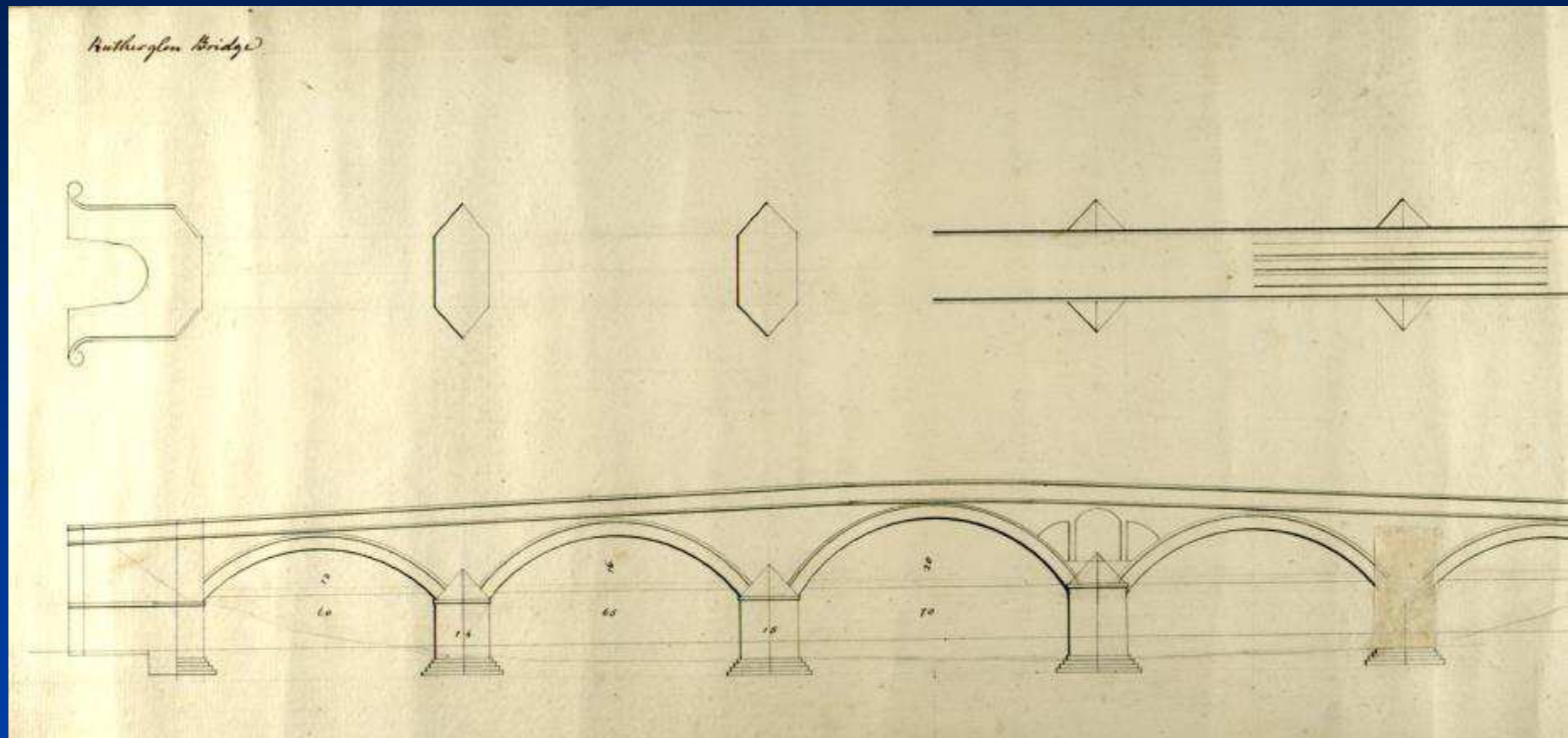
Laying the  
foundation  
stone



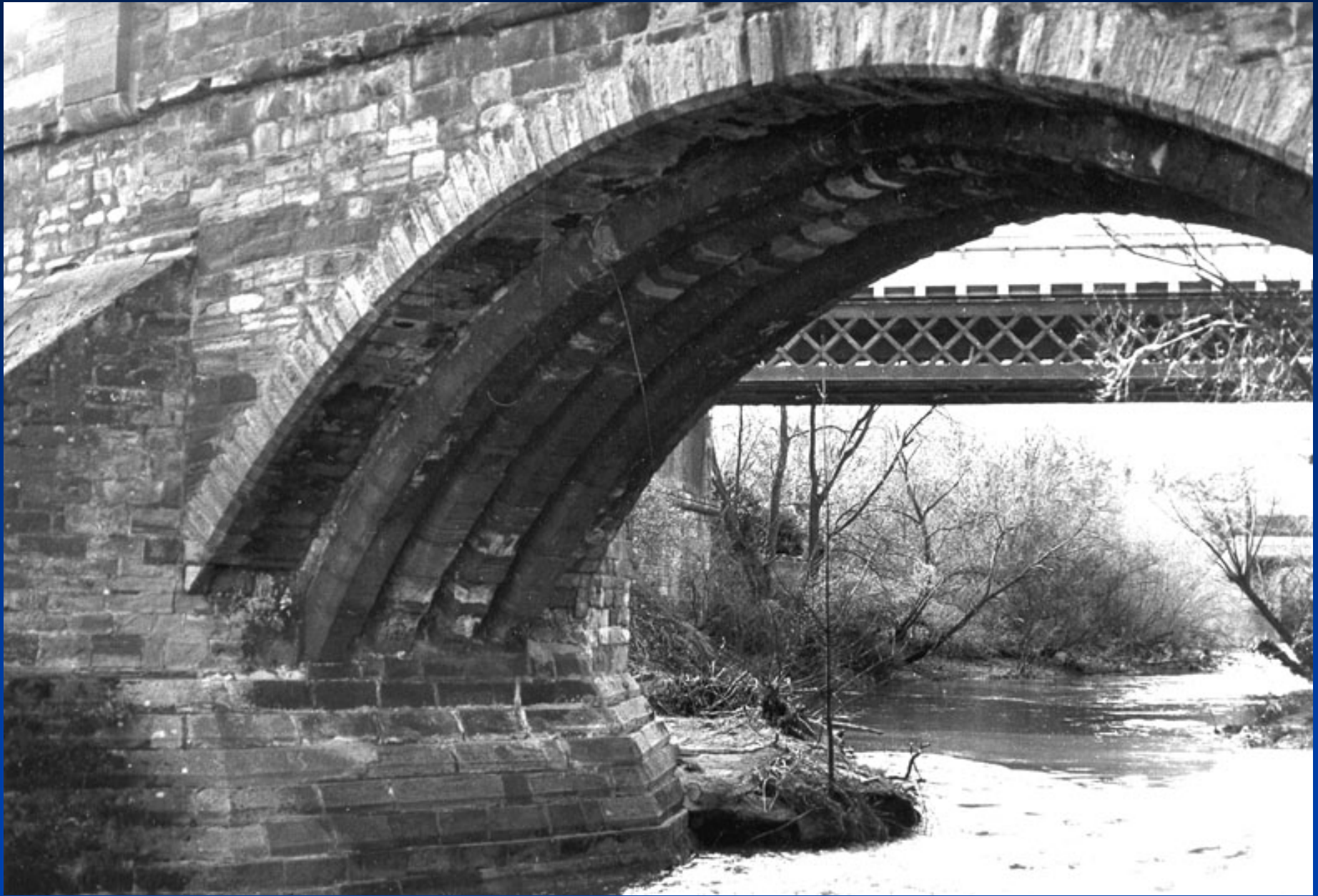
Ve Skerries Lighthouse, Papa Stour,  
Shetland, 1979

(pre-stressed concrete)

In



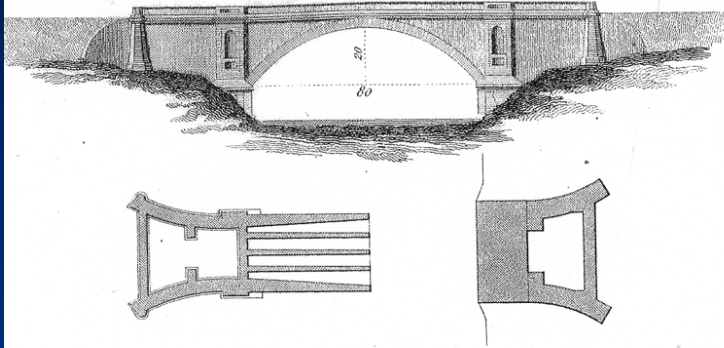
Rutherglen Bridge, Glasgow – James Watt 1774



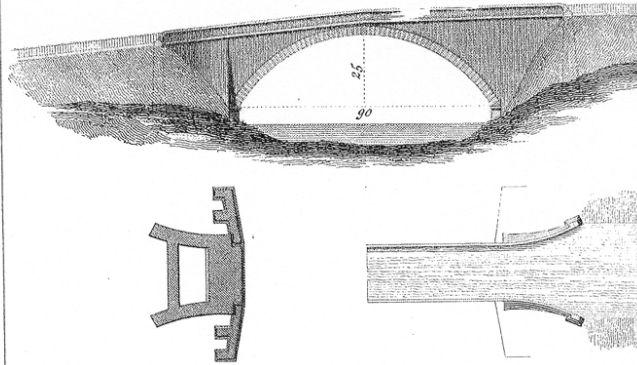
East Linton Bridges c 1550 and c 1870

GLASGOW and CARLISLE ROAD.

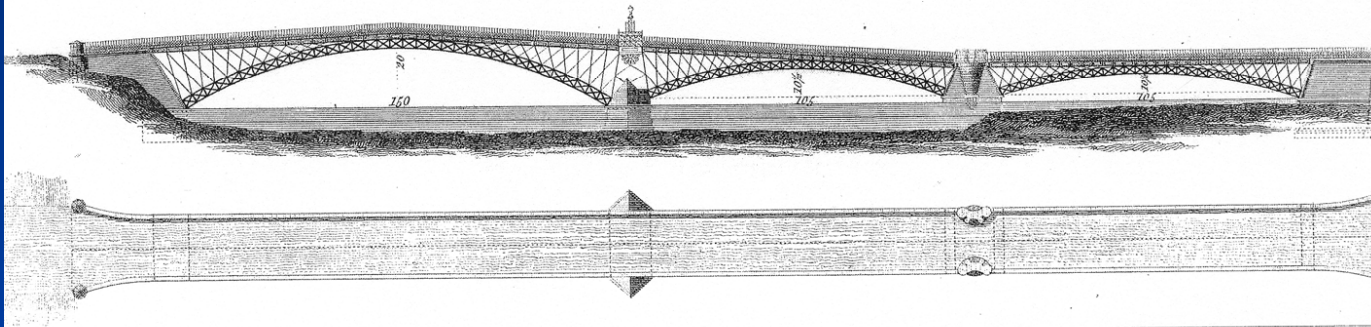
Bridge over the River Avon near Hamilton.



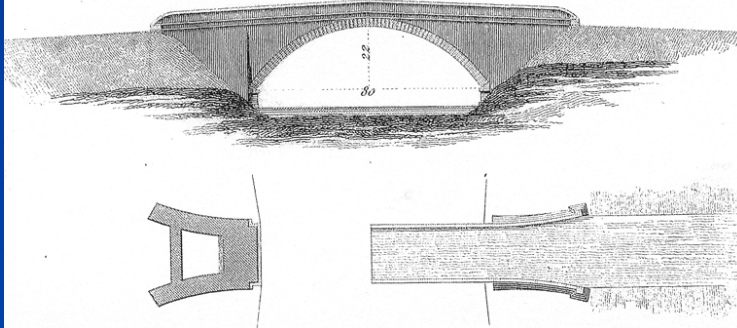
Bridge over the River Clyde at Elvanfoot in the County of Lanark.



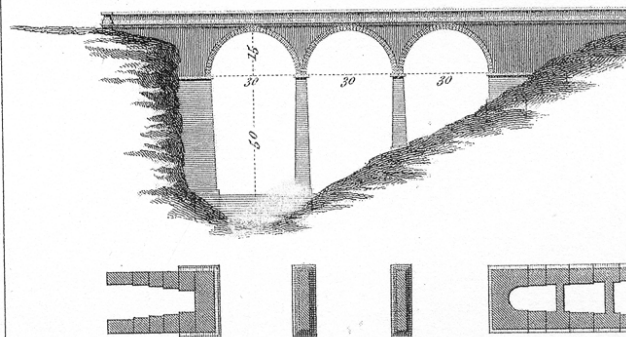
Bridge over the River Eske in the County of Cumberland.



Bridge over the River Annan at Johnstone Mill, in the County of Dumfries.



Bridge over Birkwood Burn near Lismah



Glasgow and  
Carlisle Road  
Bridges

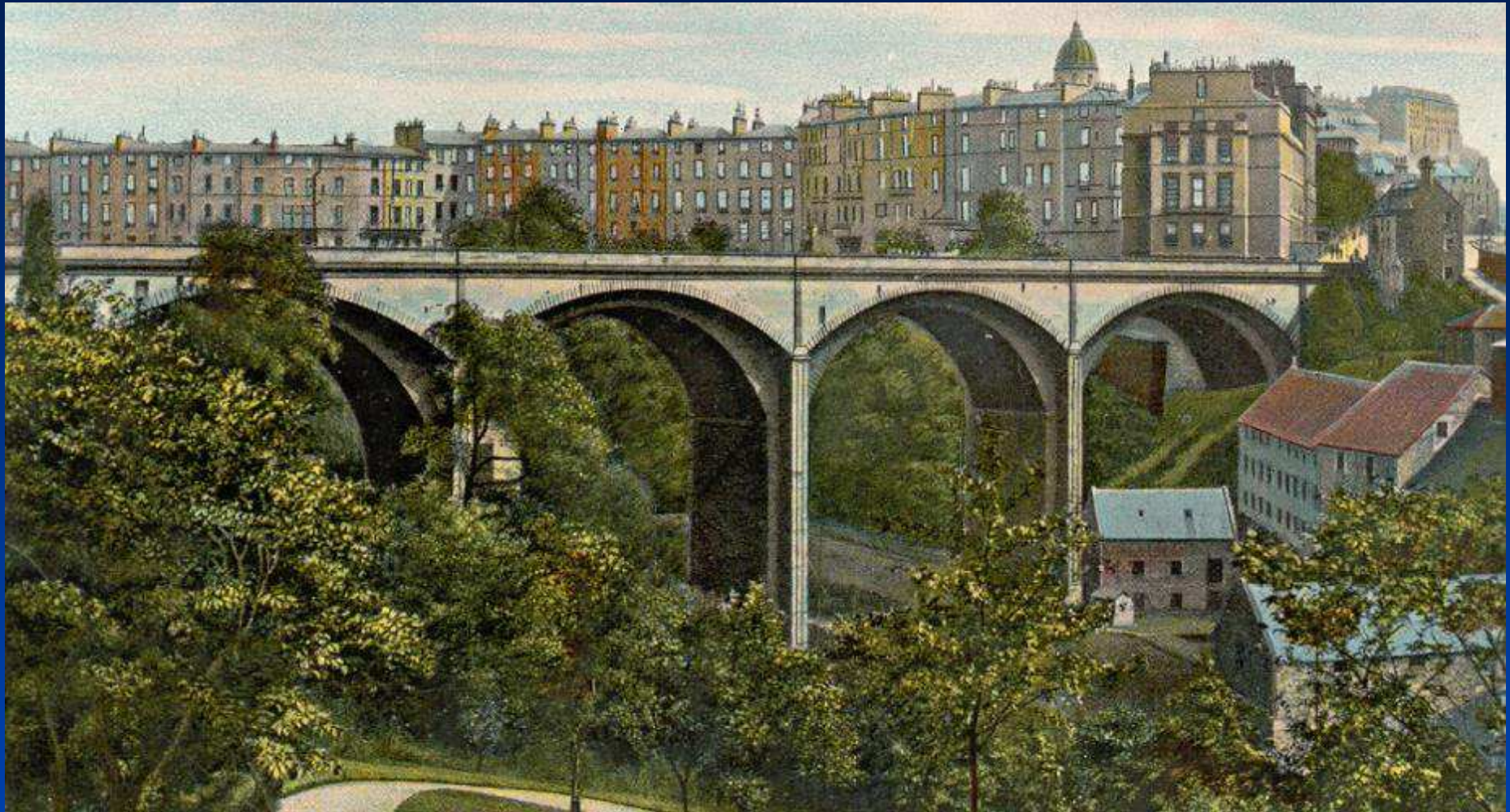
1822



Bonar Bridge 1812 – Telford – First of a new innovative genre



Union Bridge, Paxton 1820 – The world's oldest suspension bridge still carrying vehicles



Dean Bridge, Edinburgh 1832 – elegant sophistication in masonry





Ashiesteel Bridge 1848 (132 ft) (longest rubble masonry span in Scotland)



Victoria Bridge, Fort William 1849 (Dredge 250 ft) -  
Forerunner of Bridge of Oich



Saughton Park Bridge, Gorgie, Edinburgh 1907 (Mouchel 30 ft)



Great North Road (A9) 1926 – North of Blair Atholl



Bernera – Lewis Bridge 1953 – First pre-stressed example in UK

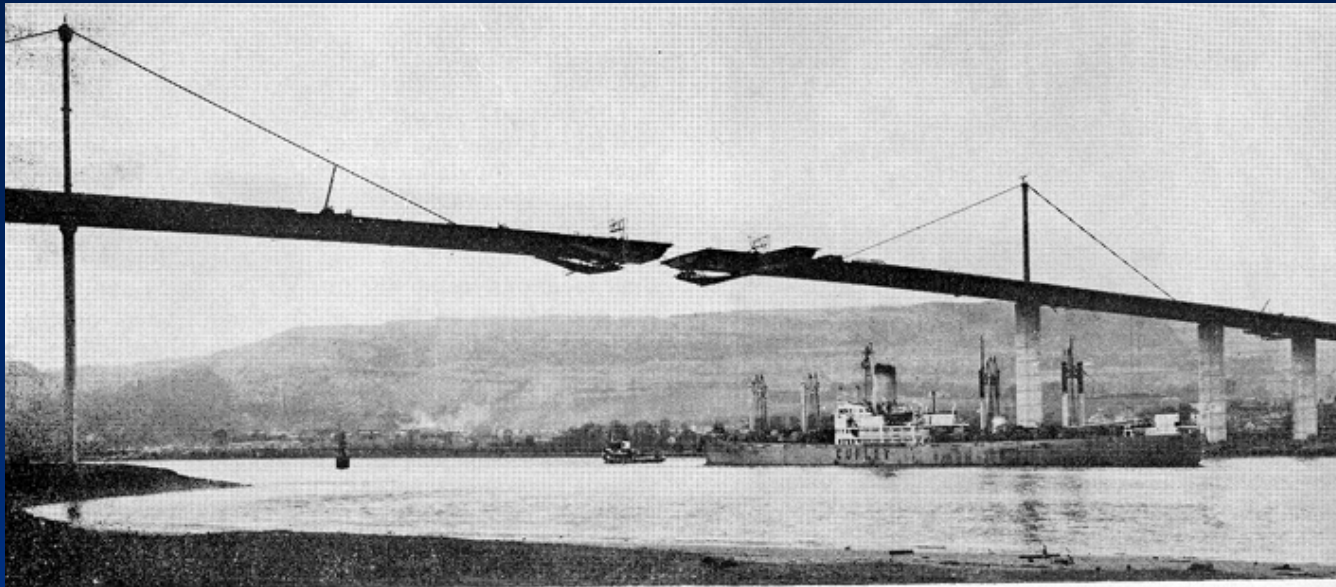


Fig 30. One more box to go.

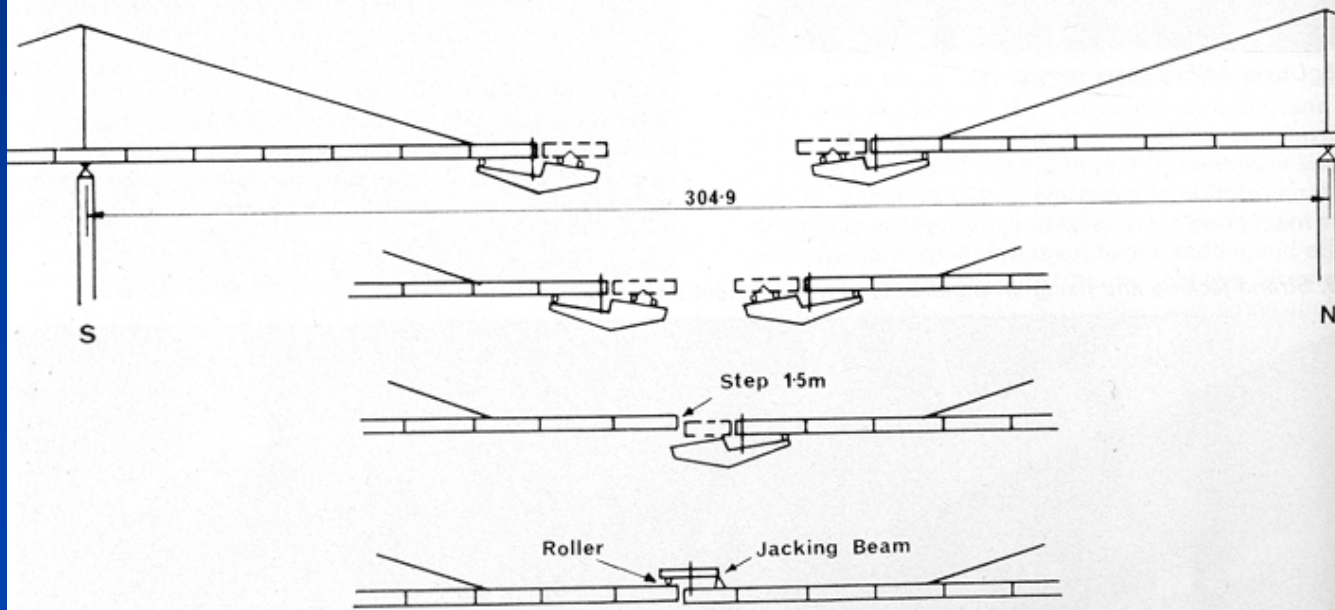
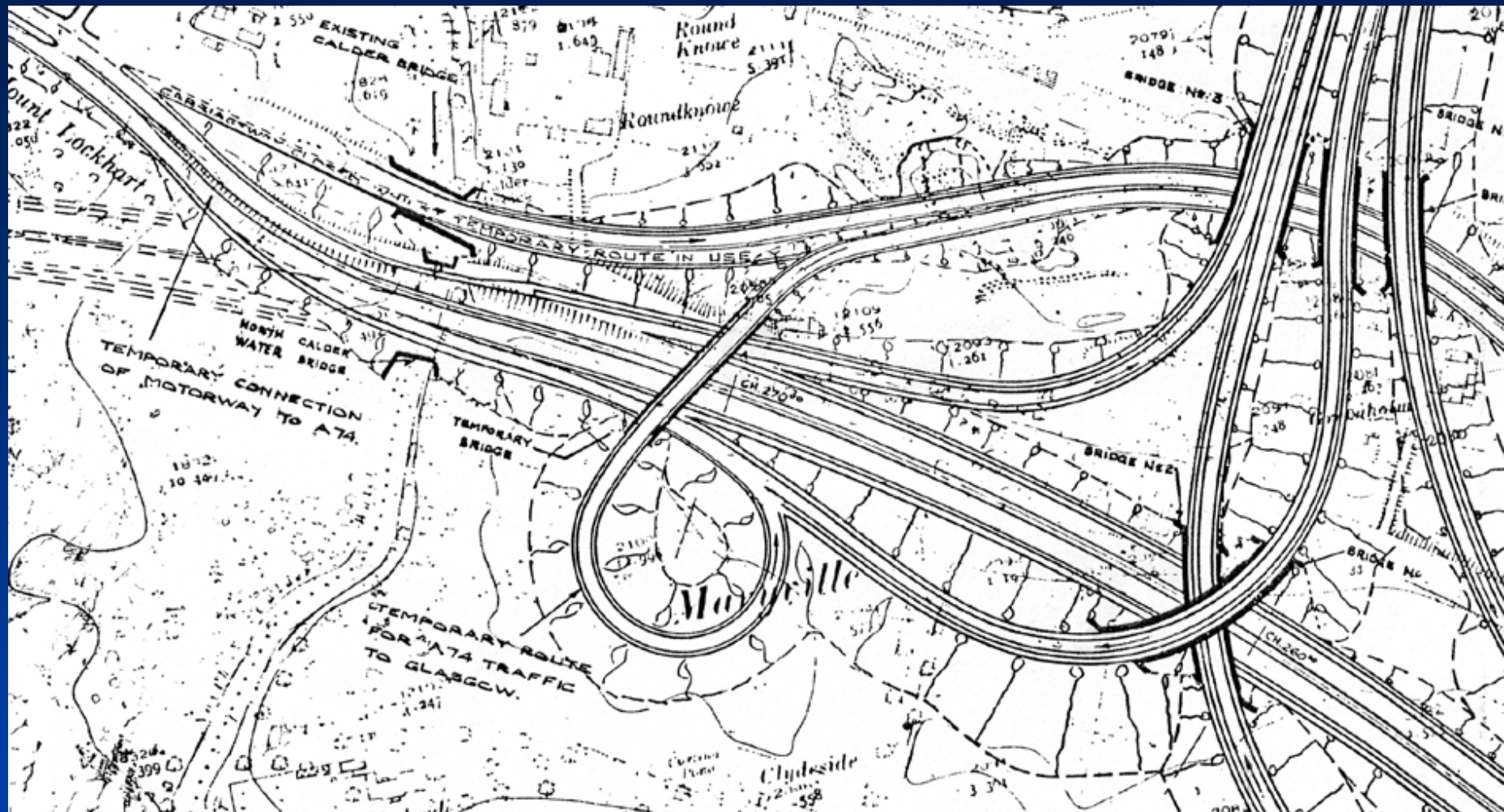


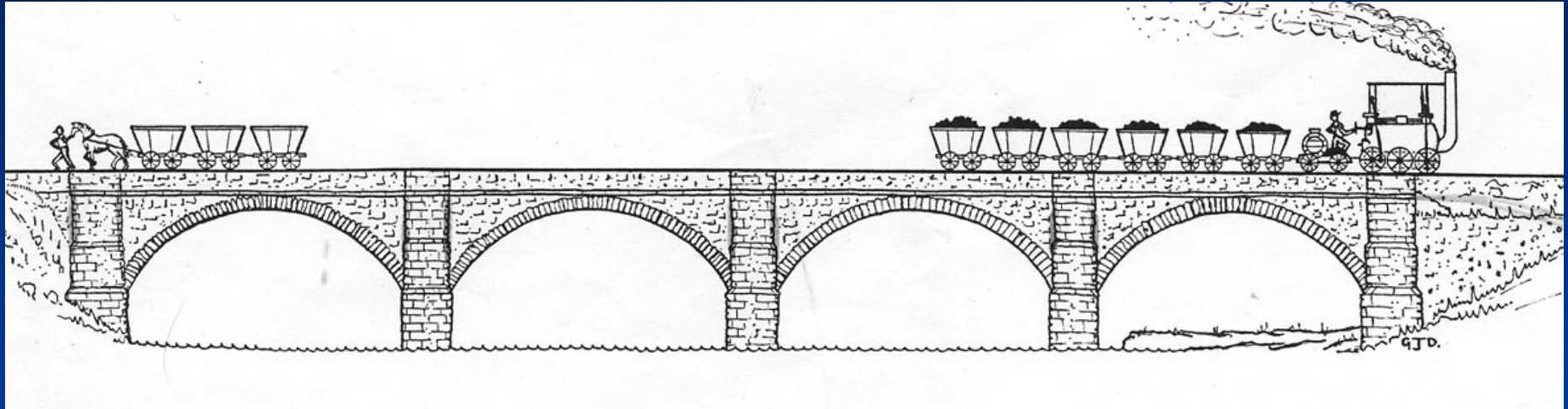
Fig 31. Erection of closing box.

Erskine Bridge  
1971 (cable-  
stay 1000 ft)

Precursor of  
Millau Bridge



M74 Interchange, Maryville, Hamilton 1968 –  
First of its type in Scotland



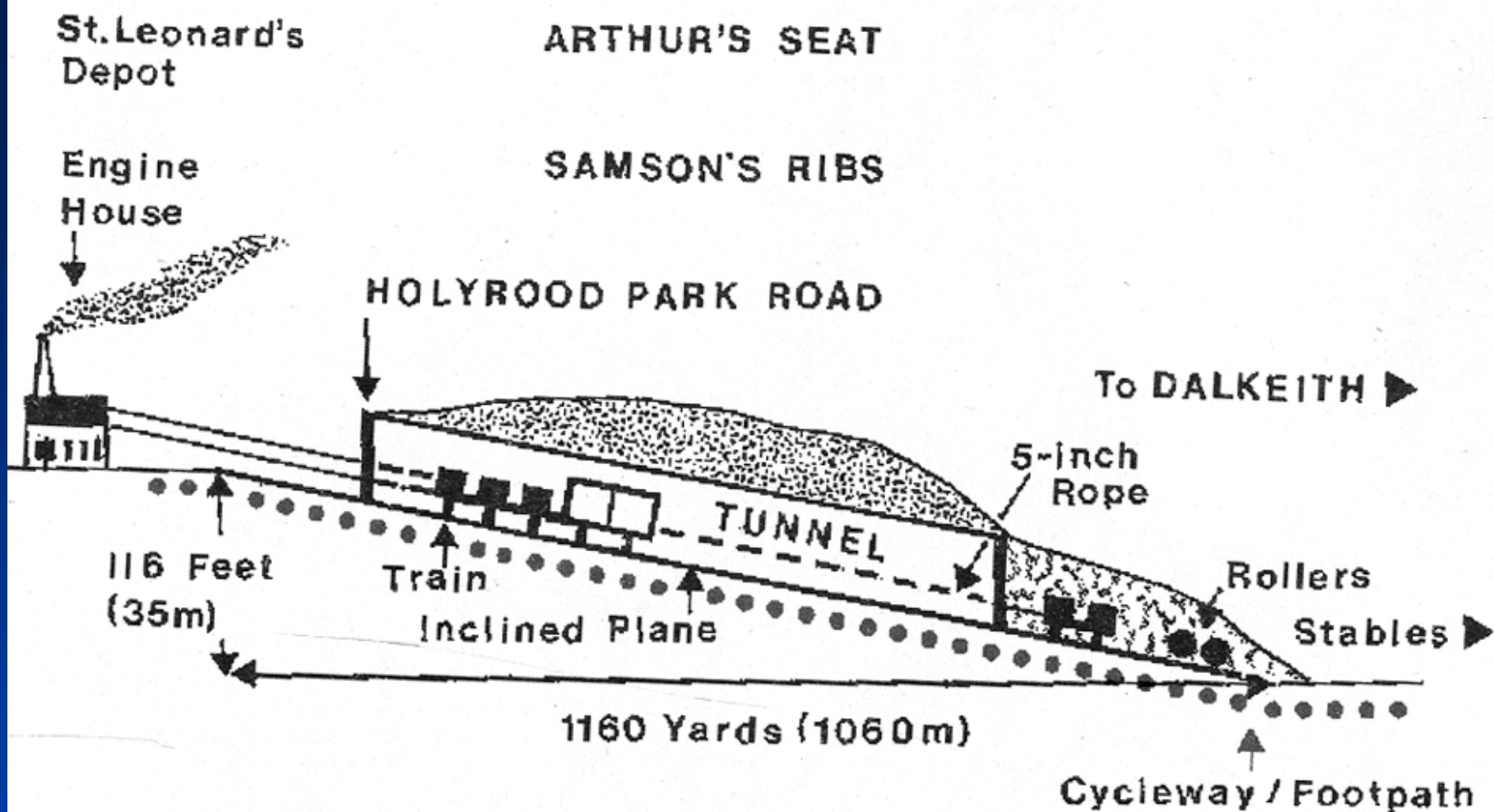
Laigh Milton Viaduct, Kilmarnock, 1811

The world's earliest surviving viaduct on a public railway



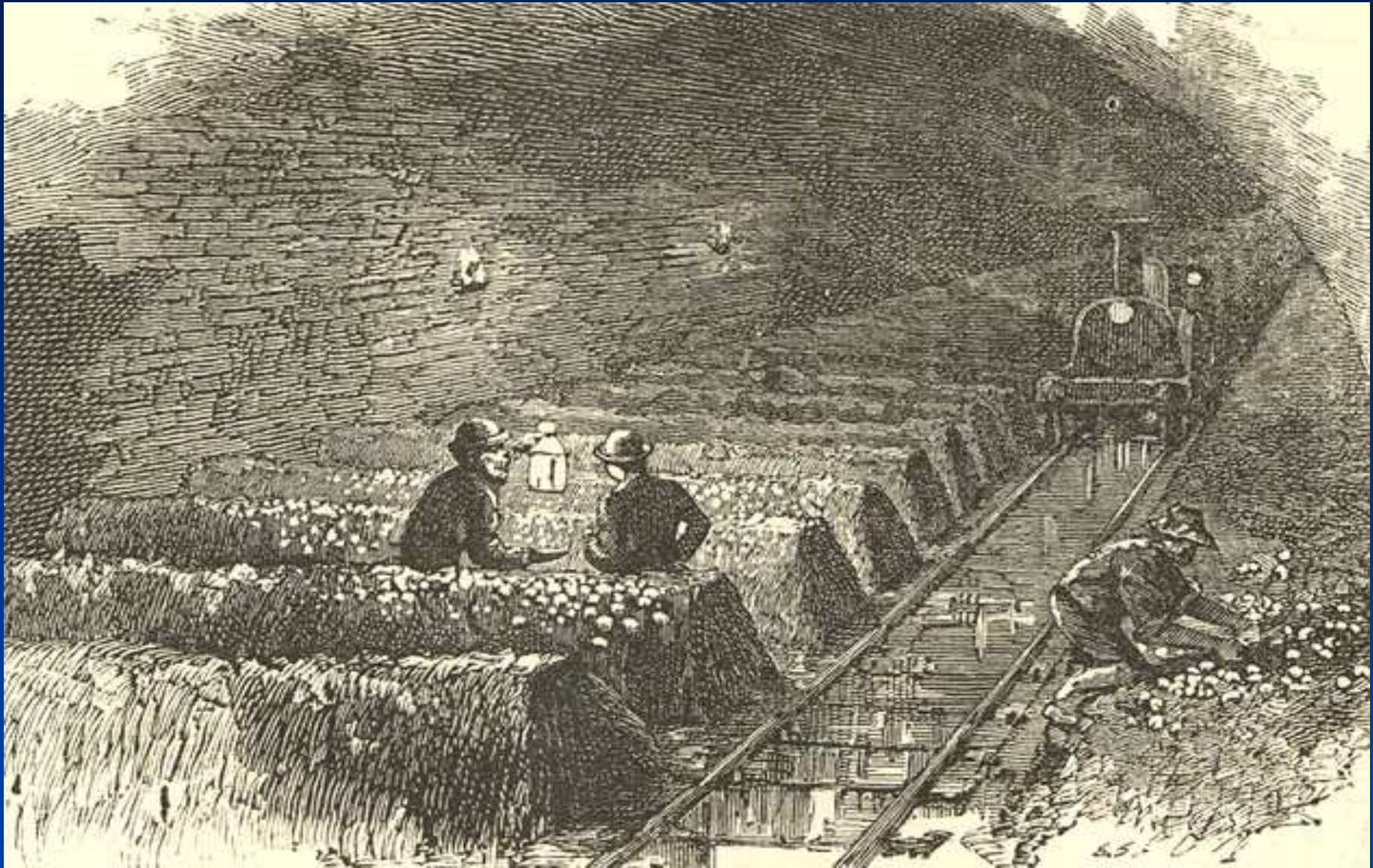


Edinburgh and Dalkeith Railway –  
Lifting Braid Burn Bridge (1831) in 2001



**EDINBURGH AND DALKEITH RAILWAY  
Inclined Plane (1831) — Vertical Profile**

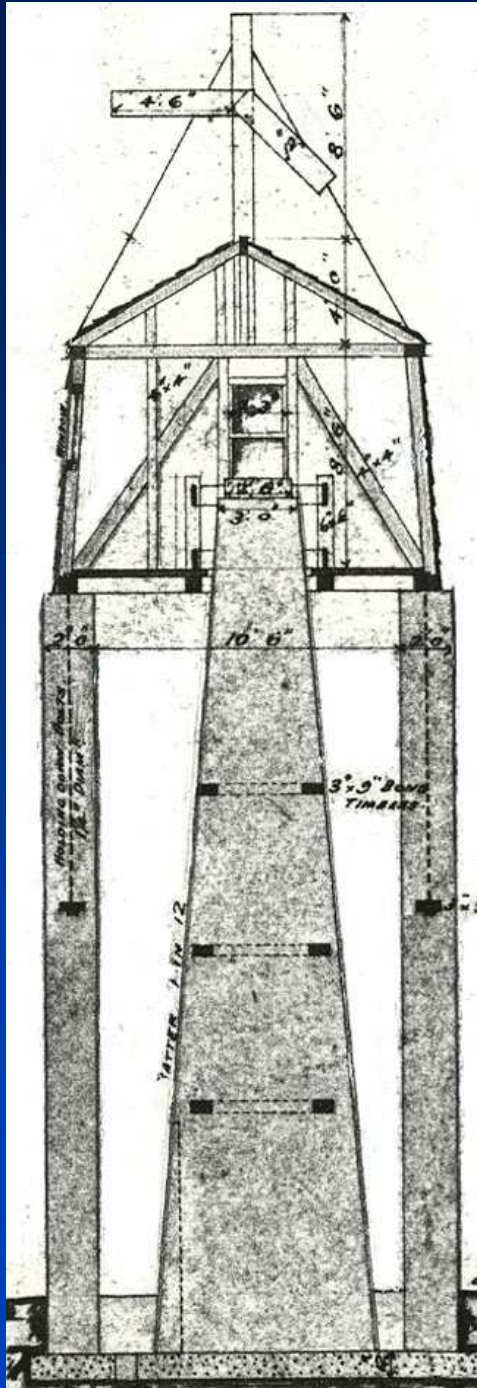
St Leonards' Tunnel and Inclined Plane



Scotland Street Tunnel, Edinburgh, 1847–68

Mushroom Growing in 1893

## Talla Aqueduct Observatory 1901



Typical 19<sup>th</sup> Century observatory for setting out tunnel lines – except for its construction in concrete



Uddingston Viaduct 1849 – Earliest survivor of type in Scotland



Queen's Street Station Roof, Glasgow 1879 (170 ft span)

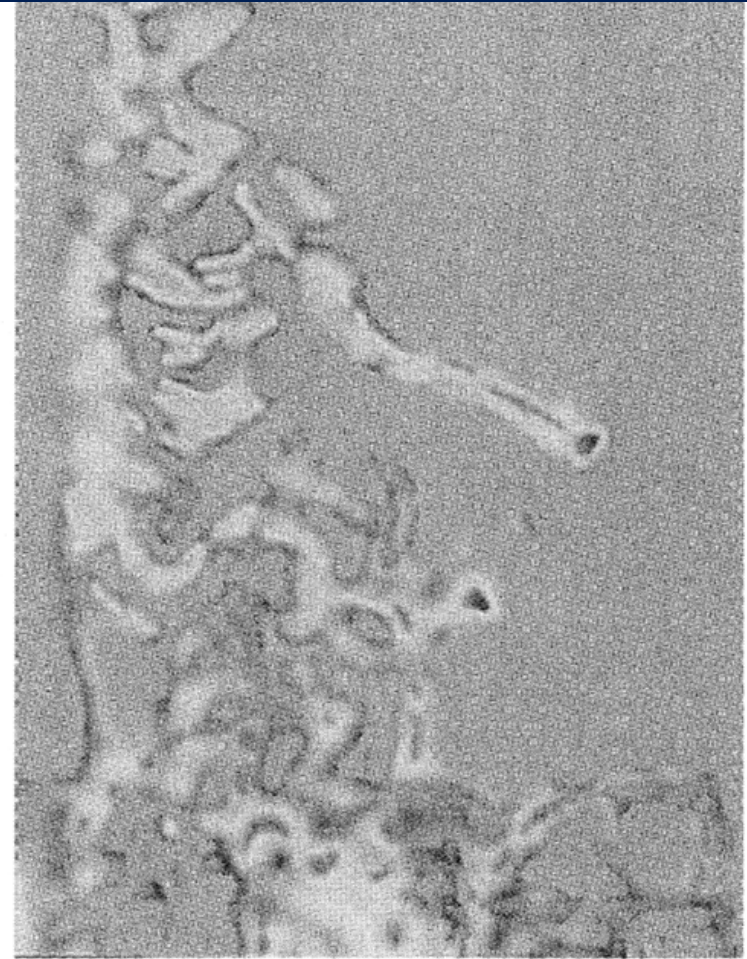


Ballochmyle Viaduct 1848 (181 ft span; 164 ft high)

Largest of type in UK



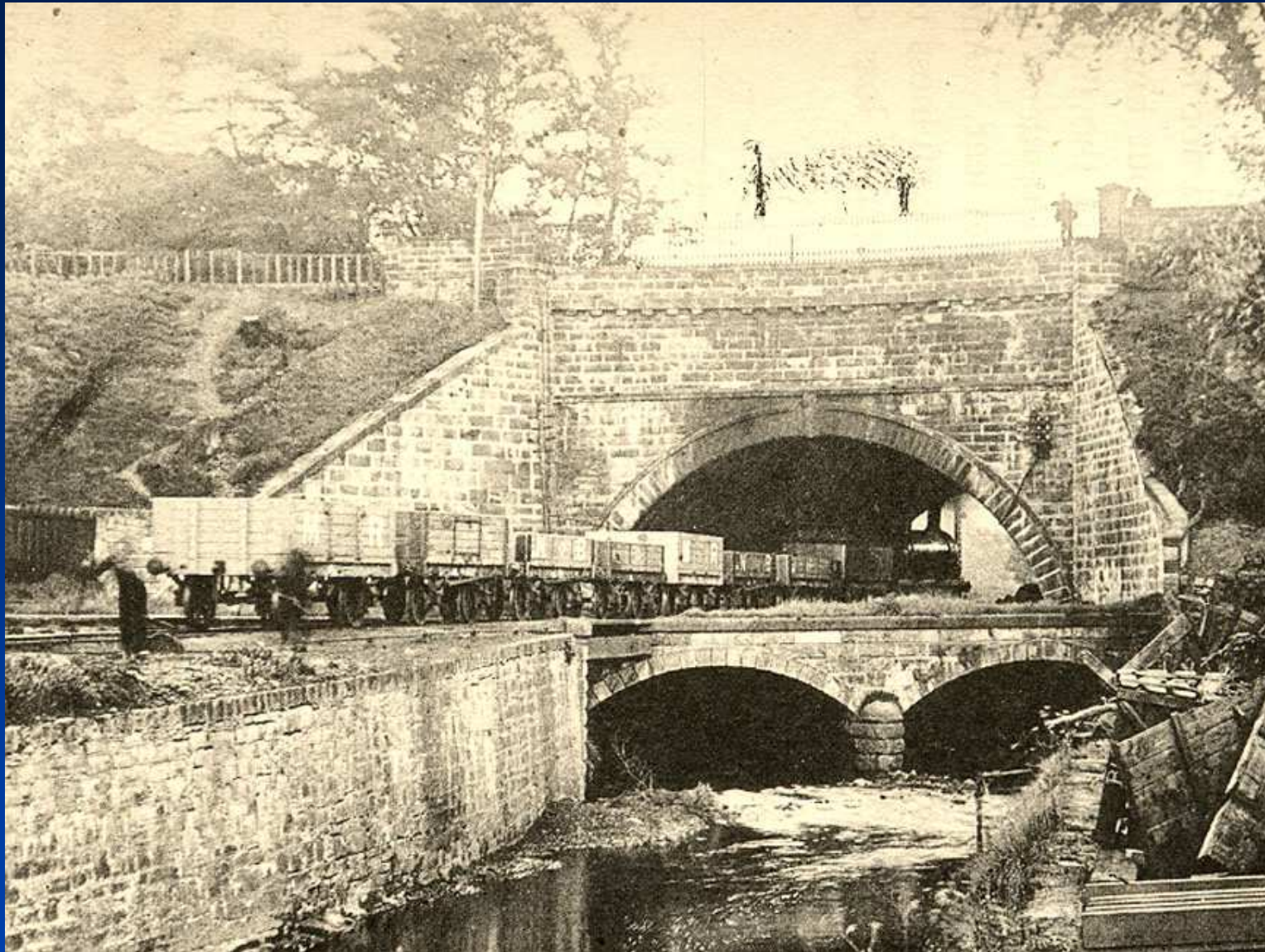
*indicates the location of the horse and cart. (RCAHMS: D48255/CN)*



*Loch nan Uamh Viaduct; radar scan of remains of horse and cart within central pier. (Courtesy of Radar World)*

## Loch-Nan-Uamh Viaduct c1899 – Mass Concrete



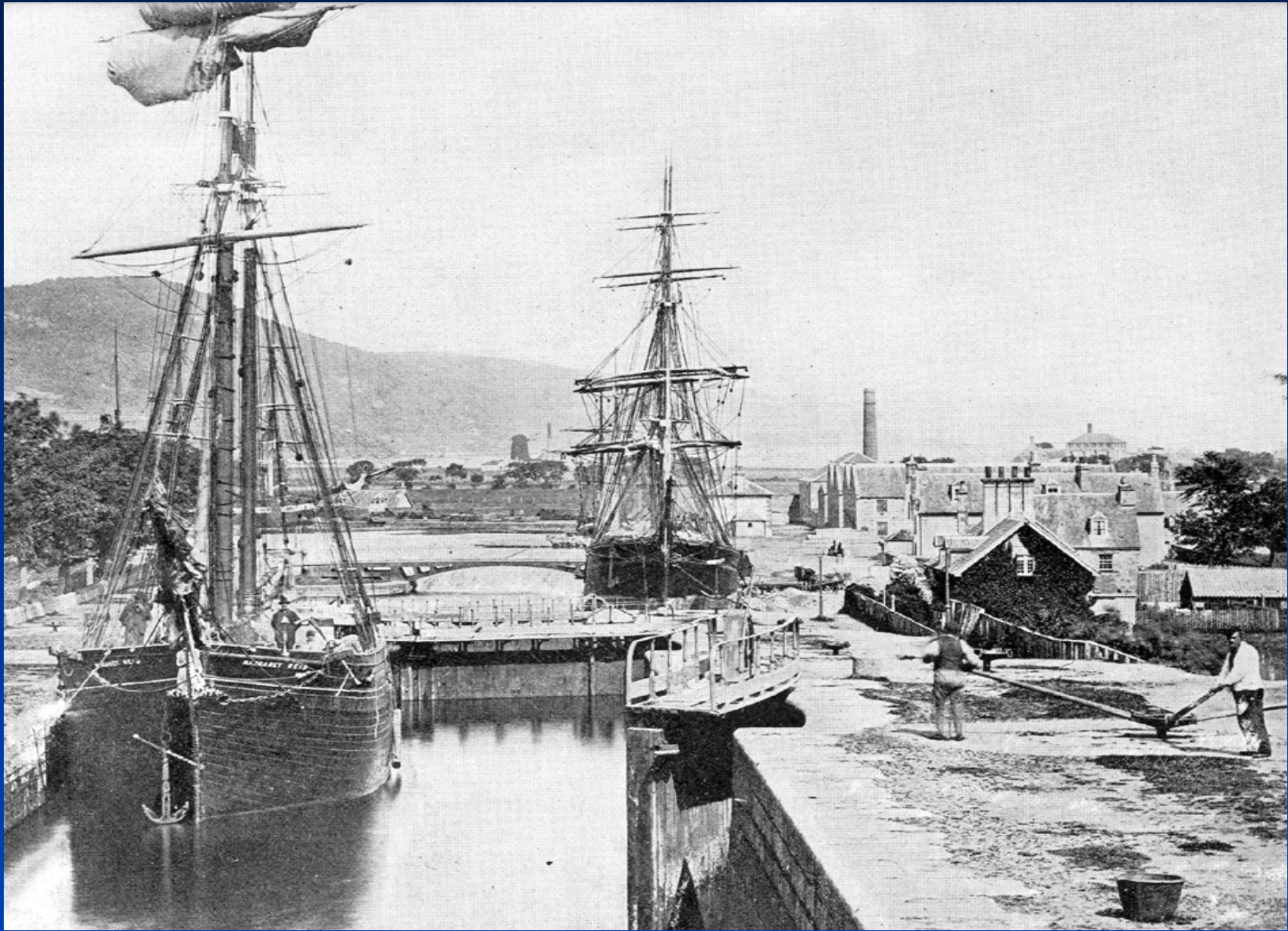


Forth and Clyde Canal

Luggie Aqueduct, Kirkintilloch 1774 (railway 1858)



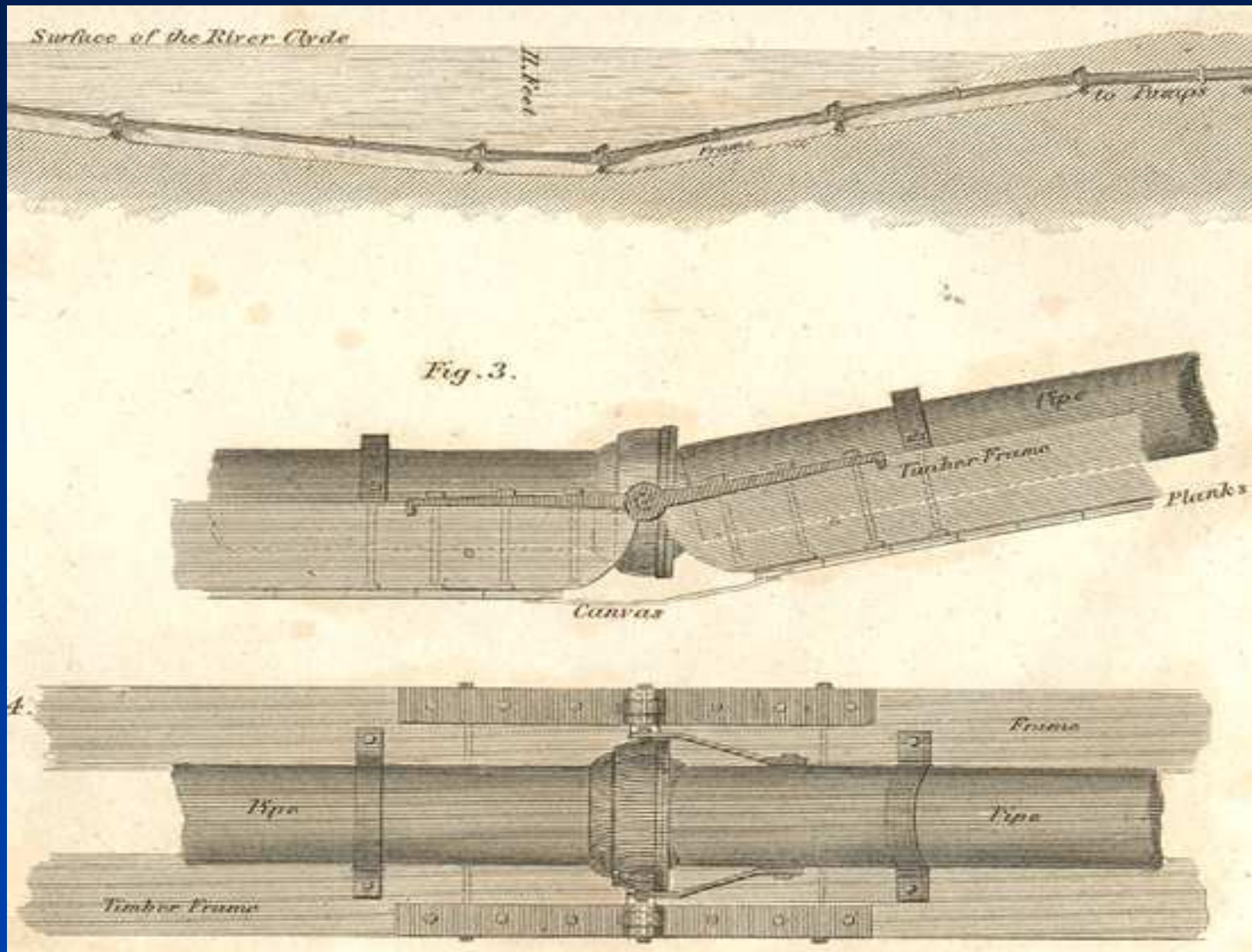
Forth and Clyde Canal, Maryhill Locks, Glasgow 1787



Caledonian Canal – Muirtown Locks and Swing Bridge 1890



Caledonian Canal - Neptune's Staircase, Banavie, 1811

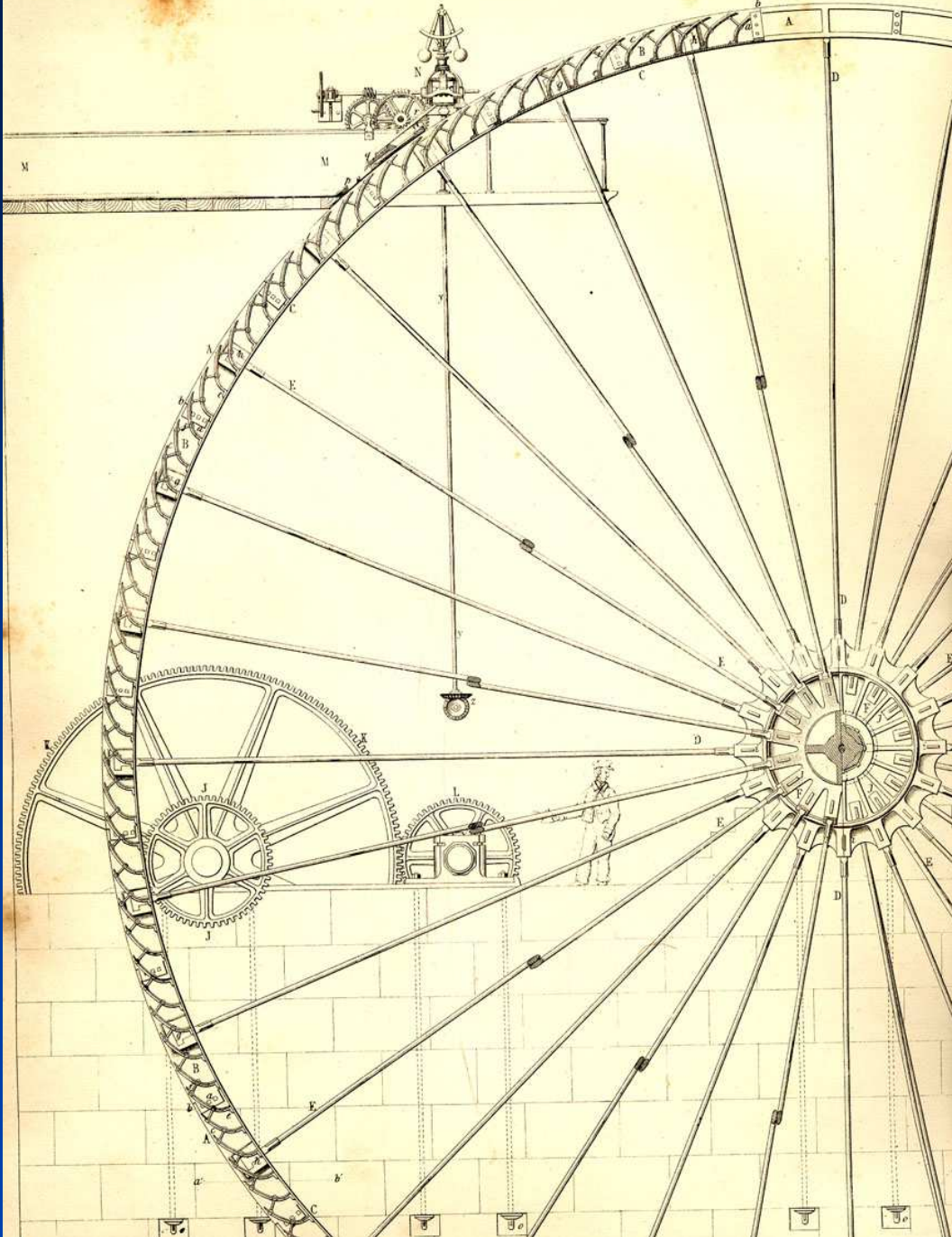


Glasgow Water – Watt's Flexible Iron Mains 1810-30



Edinburgh Water – Glencorse Dam Valves 1823

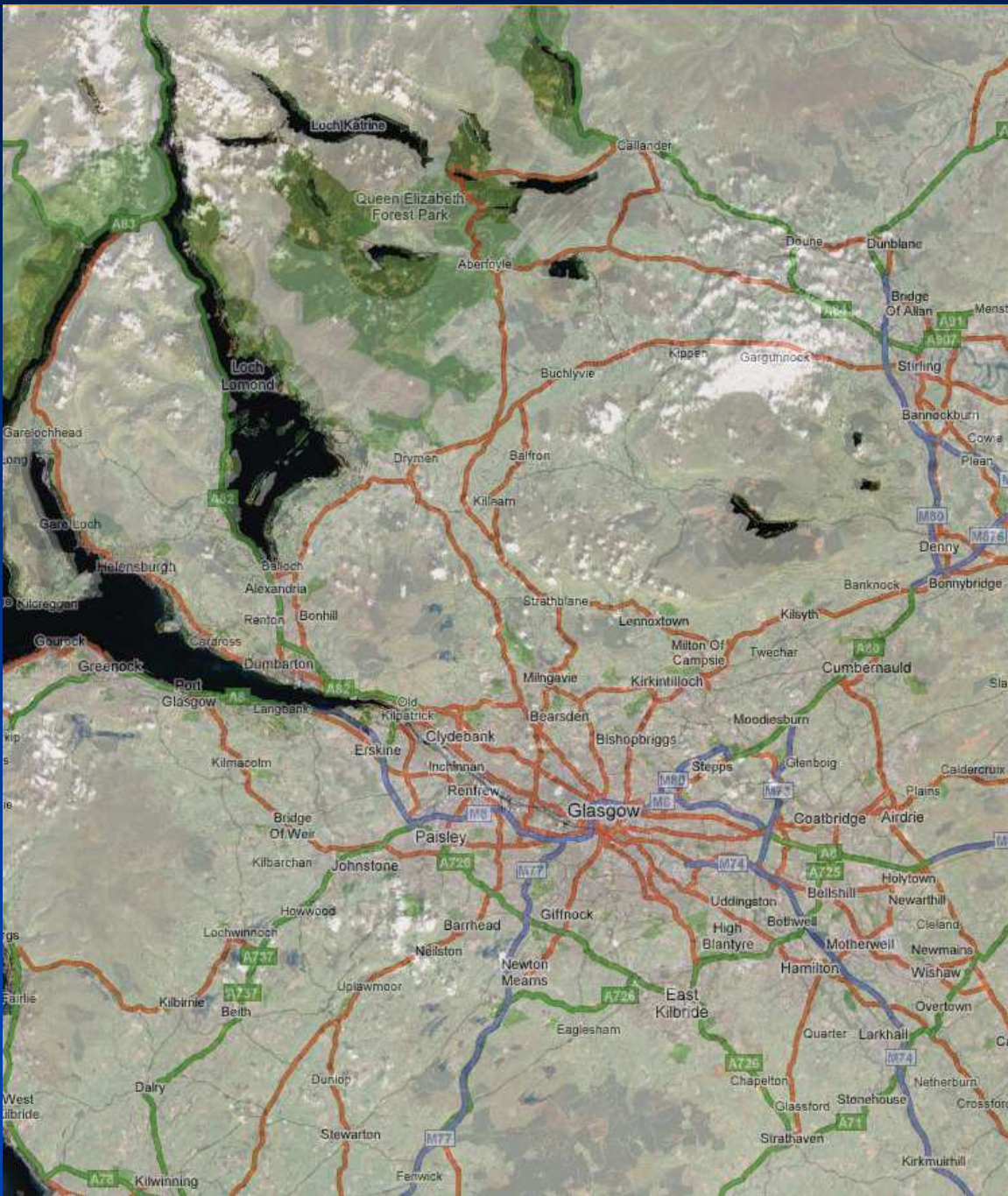
Plate LXXXVIII.



## Greenock Water Loch Thom

70 ft dia. Iron Waterwheel  
c 1840 [192hp]

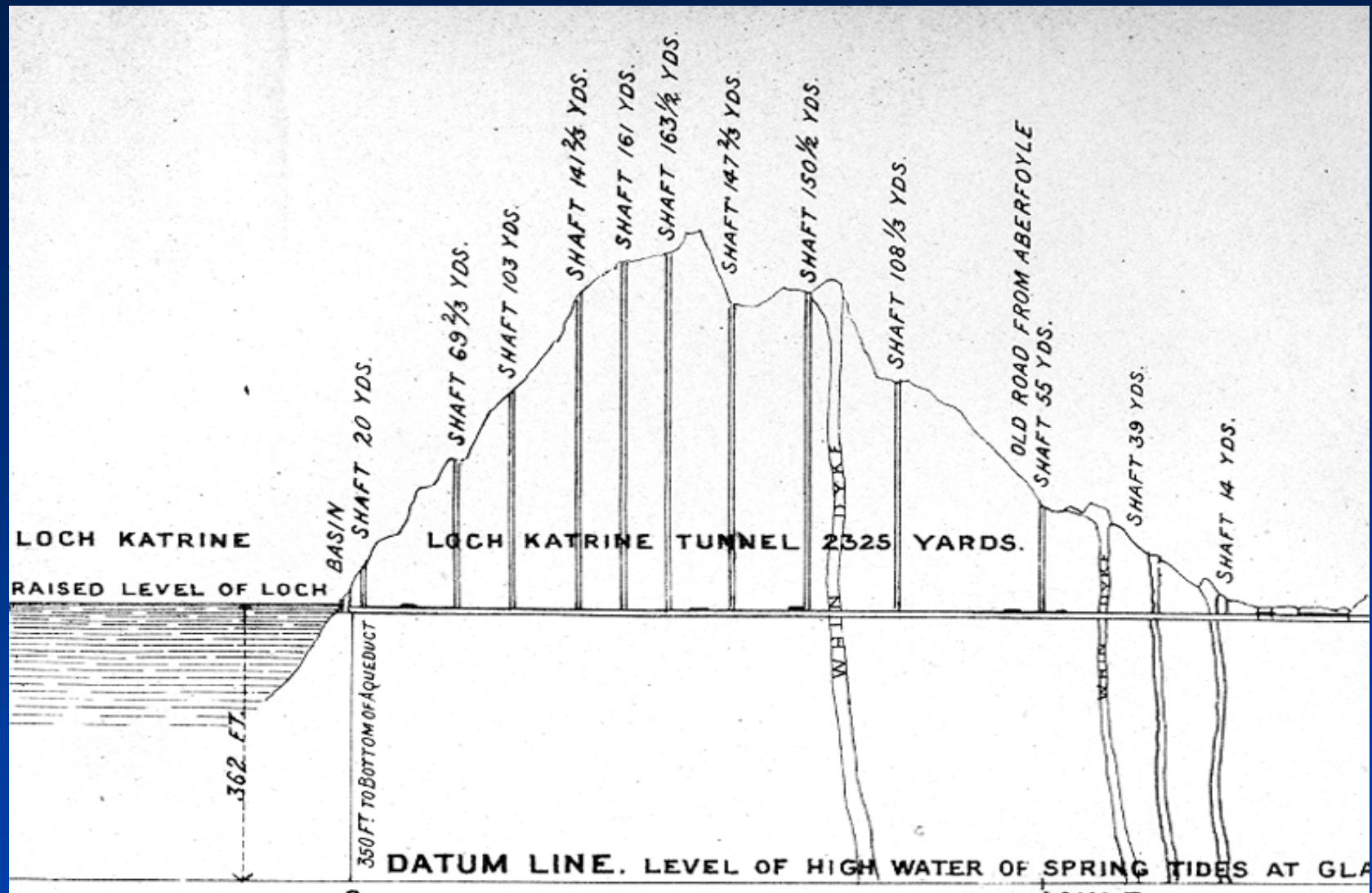
For Shaws Water Cotton  
Spinning company



# Glasgow Water Loch Katrine

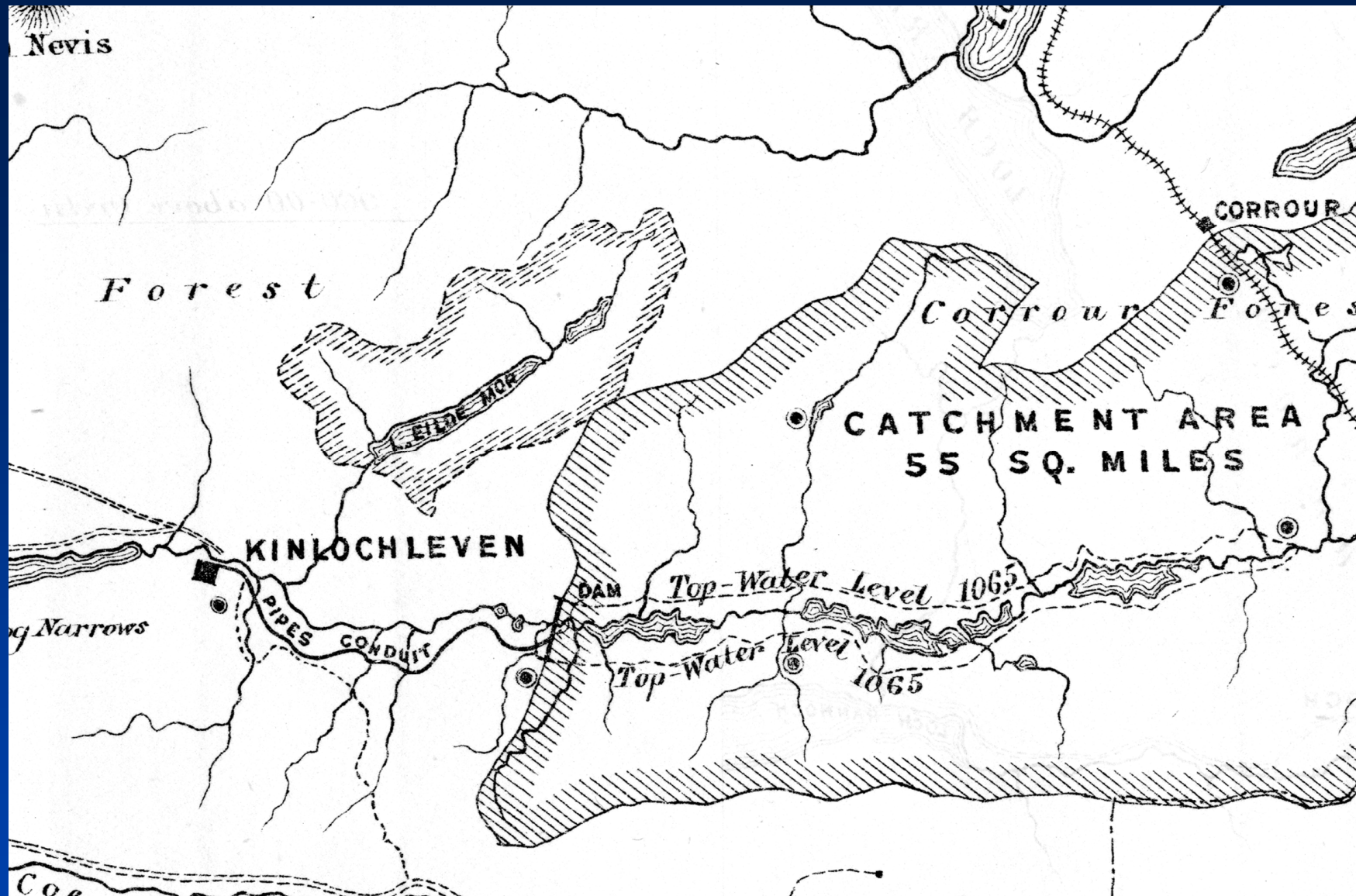
1855 and 1885 Mains  
(36 miles)





## Glasgow Water – Loch Katrine Tunnel 1855

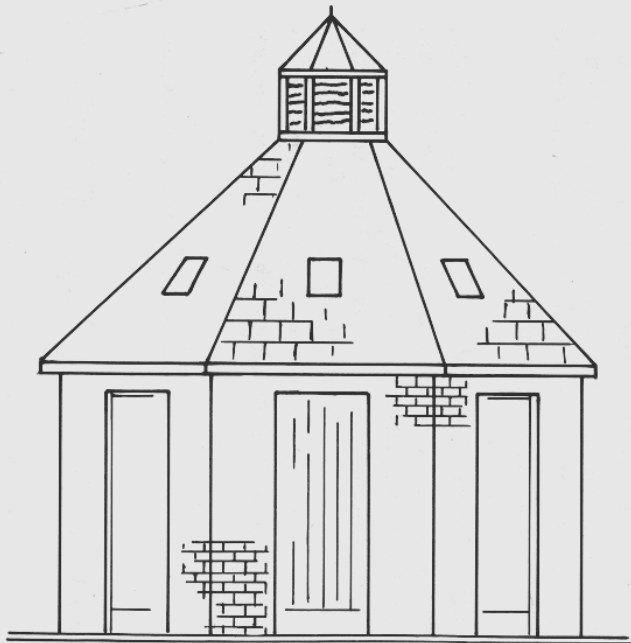
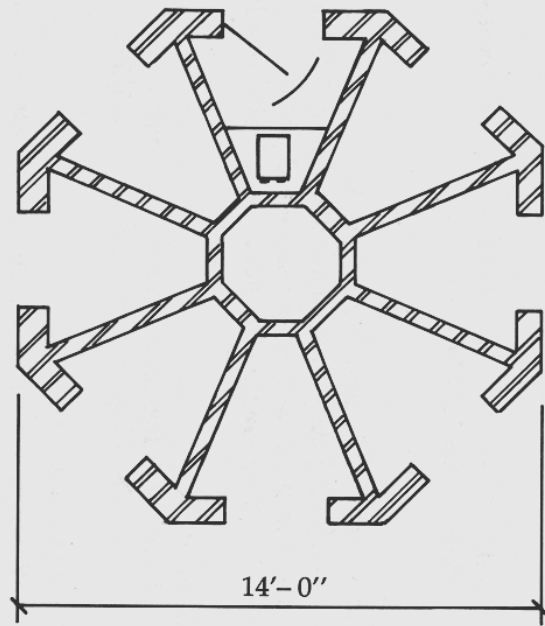
(50 mgd from 4ft rise in water level)



Kinlochleven Hydro-Electric Works 1909 (30,000 hp)

Mass concrete dam (86 ft high)

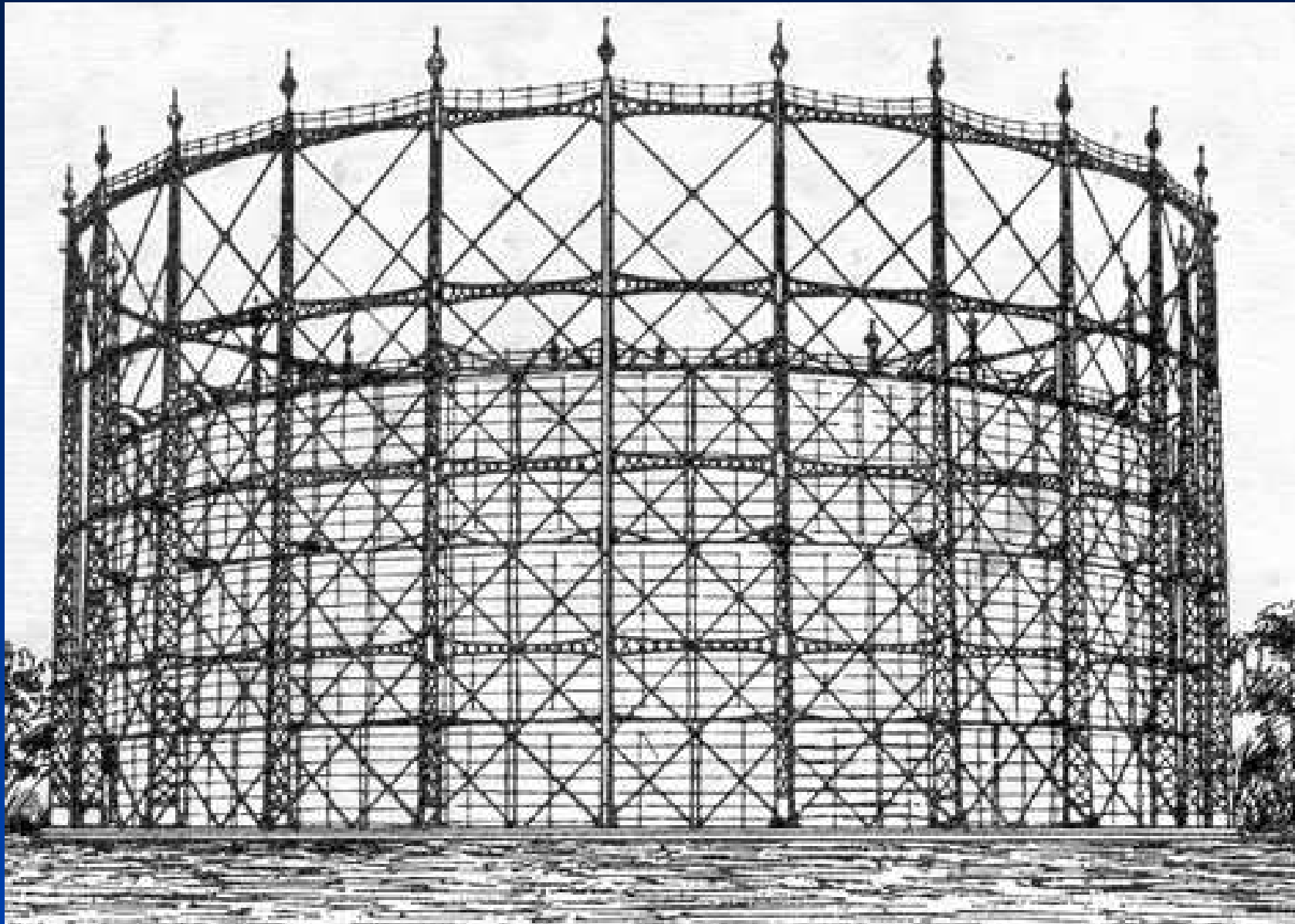
# Parton's 'Houses of Parliament' Privy 1901



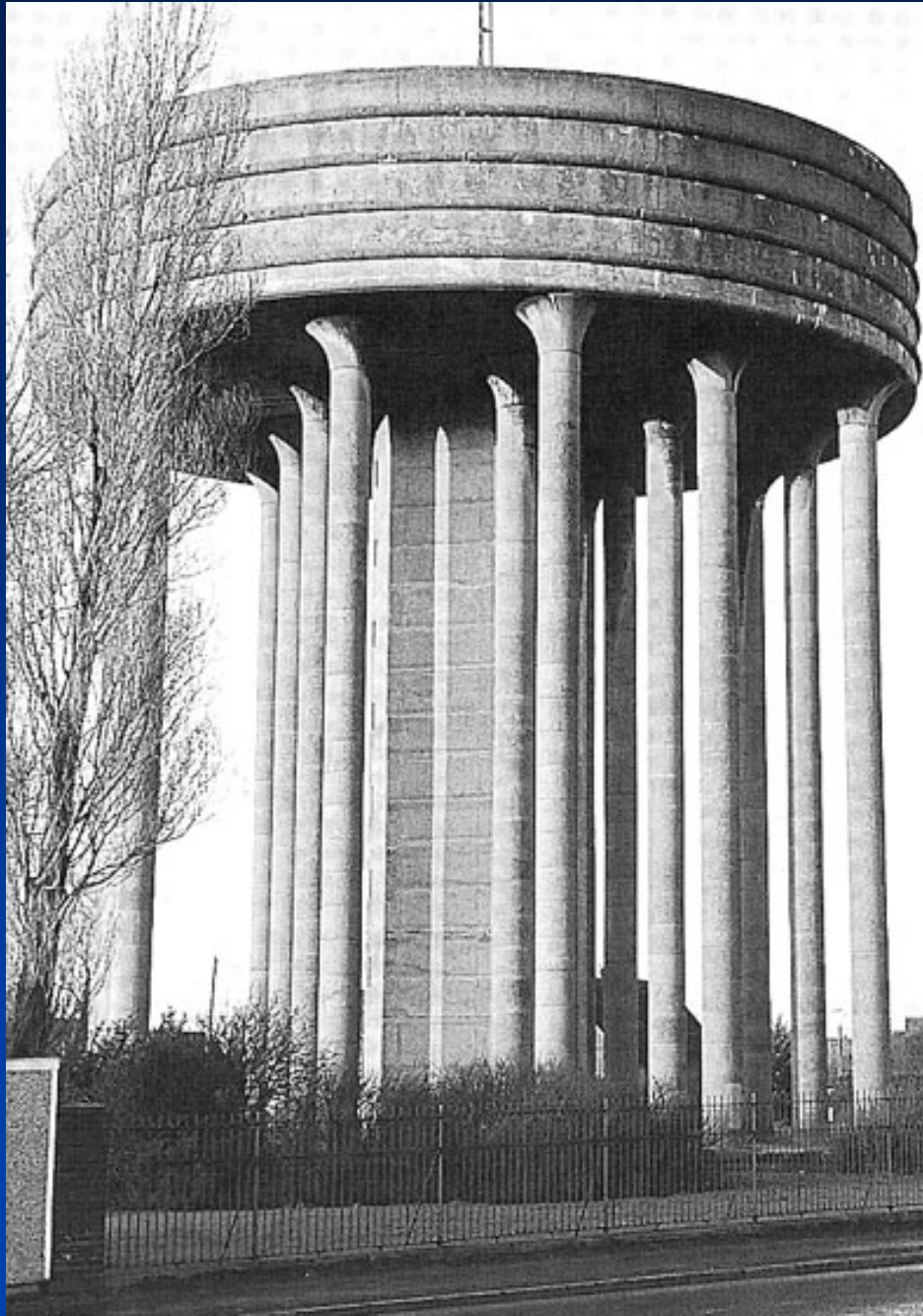


## Dalarnock Sewage Works 1894

('Globe Fertilizer' Sludge  
Cake)



Granton Gasworks 1903 (252 ft dia. 7 m cub feet)



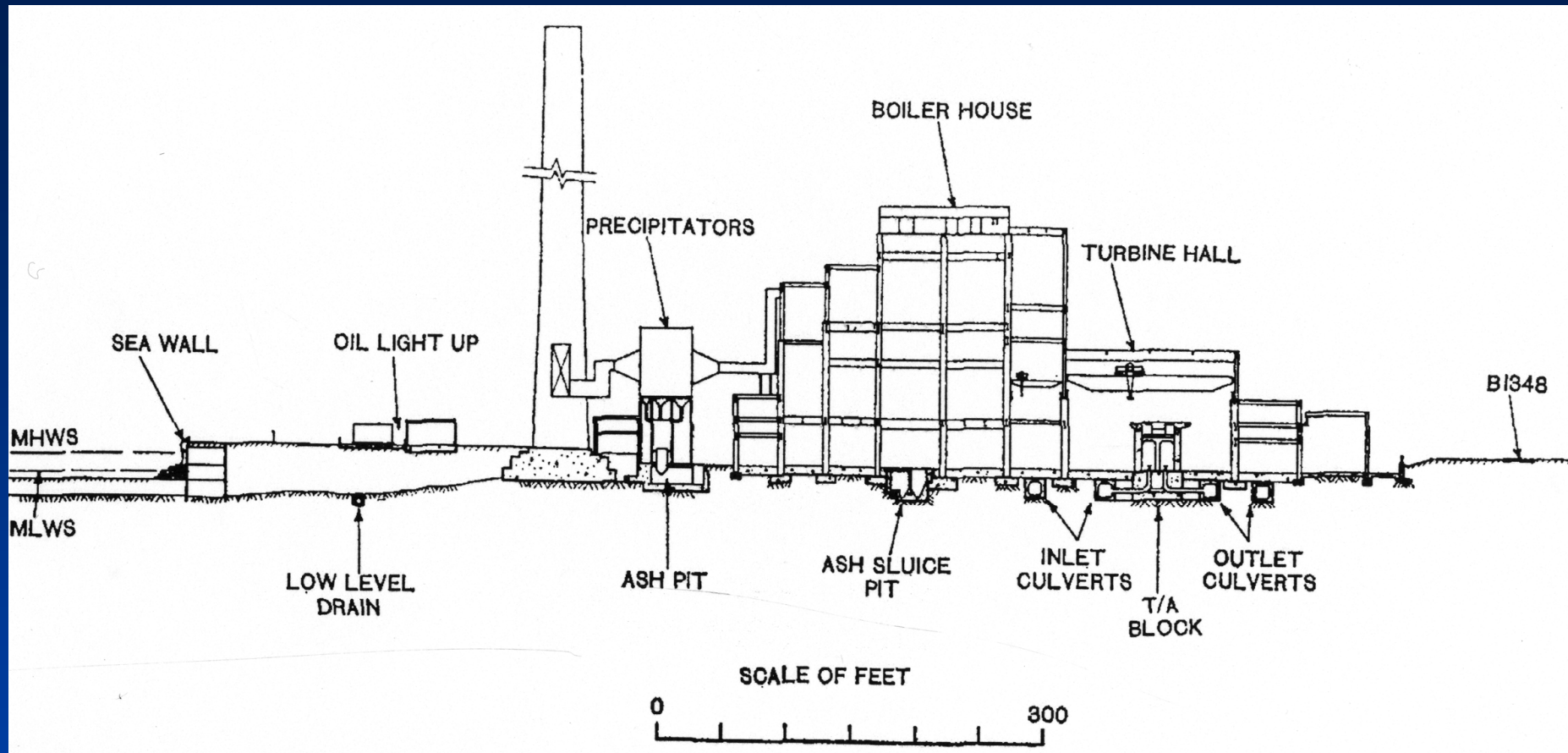
Garthhamloch Water Tower  
1958

Largest tank in the UK



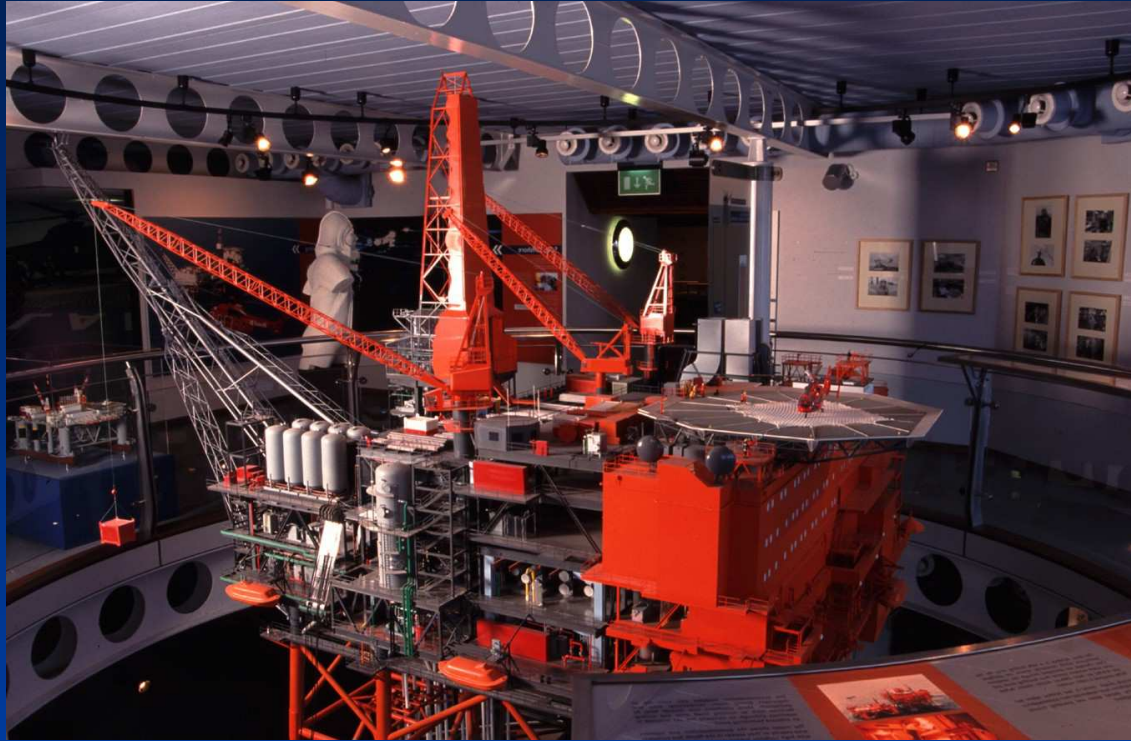
Dounreay Fast Reactor – Erecting  
Sphere 1959

Precursor of Hunterston 1964 and  
Torness 1984 stations



Cockenzie Coal-fired Power Station 1968  
 (steam pressure turbines)



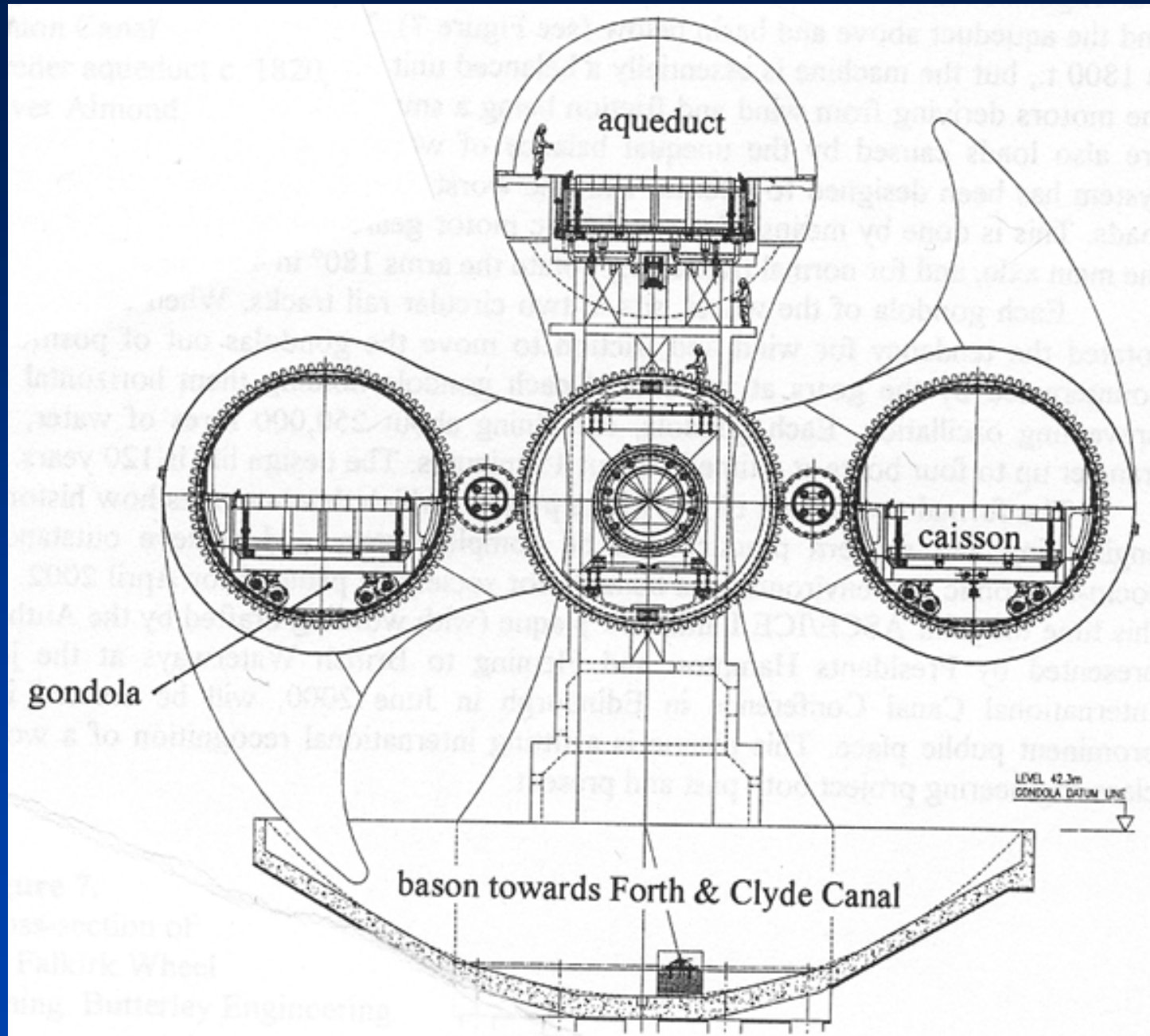


## Aberdeen Maritime Museum – Model of Murchison Oil Platform 1980

(57,000 tons; 544 ft high jacket)

# Forth and Clyde Canal – Falkirk Wheel 2002

(1800t : 35 m  
arms)





Industrial Museum of Scotland 1861-1866(E); 1875(W)