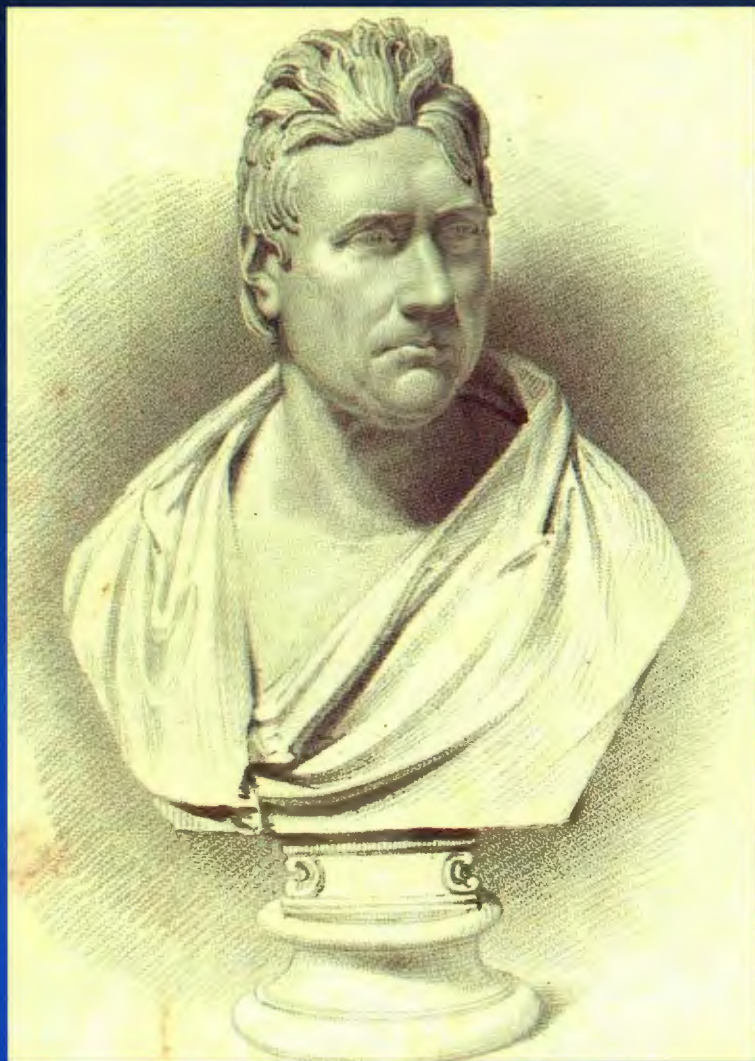




John Rennie's improvement of Scotland's infrastructure 1779-1821

By Professor Roland Paxton MBE FICE FRSE
School of the Built Environment, Heriot-Watt University



John Rennie (1761-1821) Bust
and grave inscription in St
Paul's Cathedral. His date of birth
was actually 7 June 1761

Here lie the mortal remains of
JOHN RENNIE
CIVIL ENGINEER
F.R.S. F.A.S.

Born at Phantassie in East Lothian
7th July 1761
Deceased in London 4th Octr. 1821

THIS STONE

is dedicated to his private virtue
and records
the affection and the respect of
his family and his friends
but
the many splendid and useful works
by which
under his superintending genius
England, Scotland and Ireland
have been adorned and improved
are

THE TRUE MONUMENTS
OF
HIS PUBLIC MERIT

Waterloo—Southwark—Bridges
Plymouth Breakwater
Sheerness Docks &c. &c. &c.



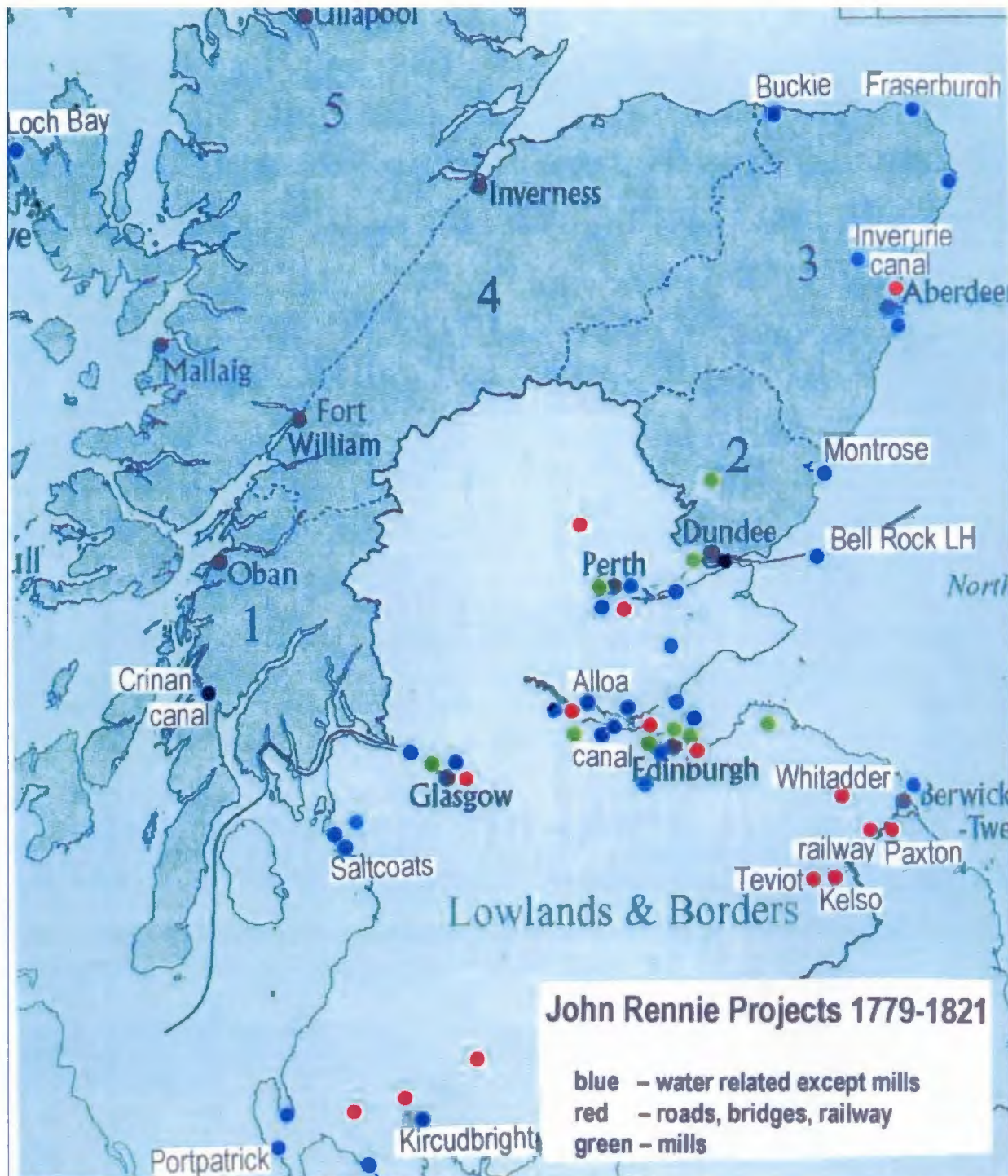
RENNIE'S BIRTHPLACE, PHANTASSIE.

[By E. M. Wimperis, after a Drawing by J. S. Smiles.]

Rennie's birthplace, Phantassie, East Linton

man of the name of Rannie. He was intended for a mill-wright, and was breeding to that business under the famous Mr Mackell at Linton, East Lothian. He had not then attended Mr Gibson for the Mathematics, &c. much more than six months; but on his examination, he discovered such amazing powers of genius, that one would have imagined him a second Newton. No problem was too hard for him to demonstrate. With a clear head, a decent address, and a distinct delivery, his master could not propose a question either in natural or experimental philosophy, to which he gave not a clear and ready solution, and also the reasons of the connection between causes and effects, the power of gravitation, &c. in a masterly and convincing manner; so that every person present admired such an uncommon stock of knowledge amassed at his time of life. If this young man is spared, and continues to prosecute his studies, he will do great honour to his country.

David Loch's
school
examiner's
report on
Rennie at
Dunbar High
School in 1778.
Rennie was at
Edinburgh
University 1780-
83 – studied
part-time under
Professors
Robison and
Black
FRSE 1788
FRS 1798



John Rennie's Scottish Projects. His early work included: mills and millwork (green) canals, harbours water supply (blue) roads, bridges, railway (red)

to Rochdale - I am now on my way to Inverary
to survey [redacted] - Loch Crinan to Loch Gilp two
Arms of the Sea - for Dr. Fell of Large Buthen - I shall
be at Inverary for a fortnight to come. When any
letter addressed to the Post Office will find me -
from Inverary I go by the Ports of Tobermory in
the Isle of Mull to Ullapool & then to Wick in
Caithness to survey the different Harbours at the
Place & about the beginning of August next

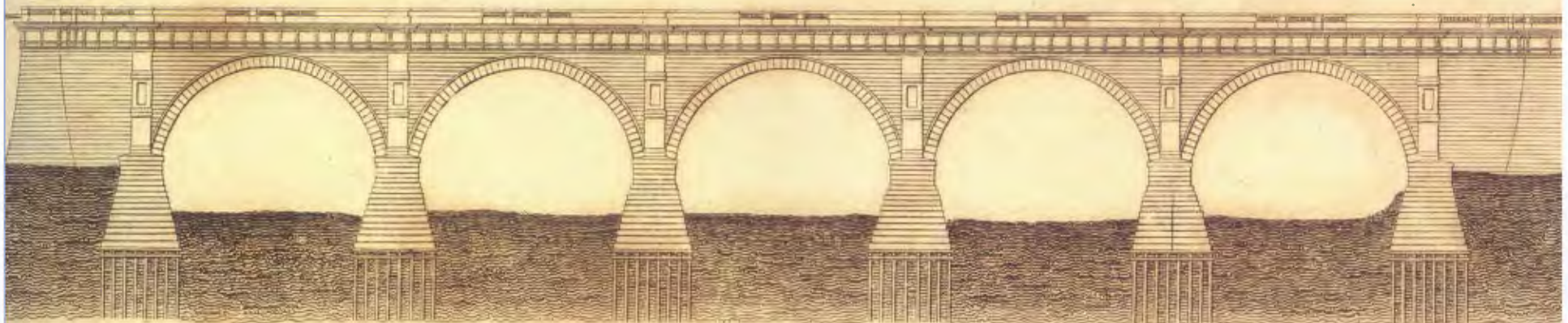
Rennie letter re. Rochdale Canal in July 1792. Busy life - Crinan Canal
survey - Inveraray, Tobermory, Ullapool, Wick, & Inverness Harbours



© RCAHMS

9-mile
Crinan Ship
Canal, Crinan
1794-1809
& Lune
Aqueduct
on 76-mile
Lancaster
Canal
(nr. Wigan-
Kendal)
1793-98

Fig. 5. LUNE AQUEDUCT LANCASTER CANAL.



Scale to the plans & sections.



Rennie's
Queensferry
ramped pier
improvements
1808-17.

Note Hawes
(Newhalls) and
Longcraig piers

tertaind of it have fallen very short of the reality. It appears from an account kept by the superintendant, that during the year ending 15th May 1811 there crossed at the Queen's-ferry two HUNDRED AND TWENTY-EIGHT persons every day throughout the year. And on some days so many as FOUR HUNDRED AND FORTY-SEVEN were ferried over. There passed during the same year

Carriages	-	-	-	1515
Carts	-	-	-	4254
Horses	-	-	-	13,154
Cattle	-	-	-	18,057
Sheep	-	-	-	25,151
Barrell Bulk	-	-	-	5,520
Dogs	-	-	-	2,615

by far the greater part of which travelled along the Great North Road. The value of the goods intended for sale amounting to near 400,000l., making a total of insurable property conveyed by this communication of about 900,000l.

Queensferry patronage in 1811 from Rennie's report



Hawes Pier, Queensferry in 2008

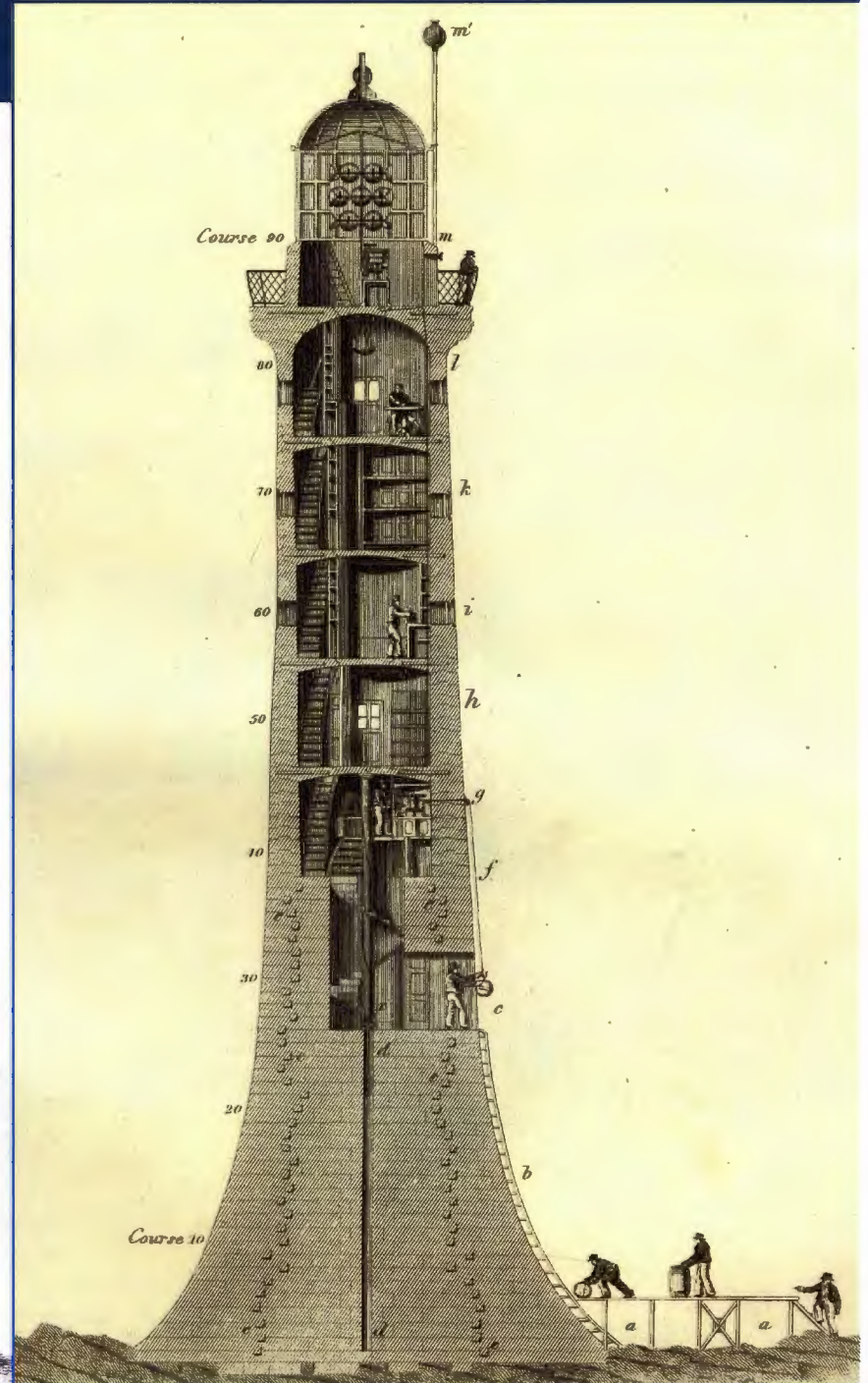
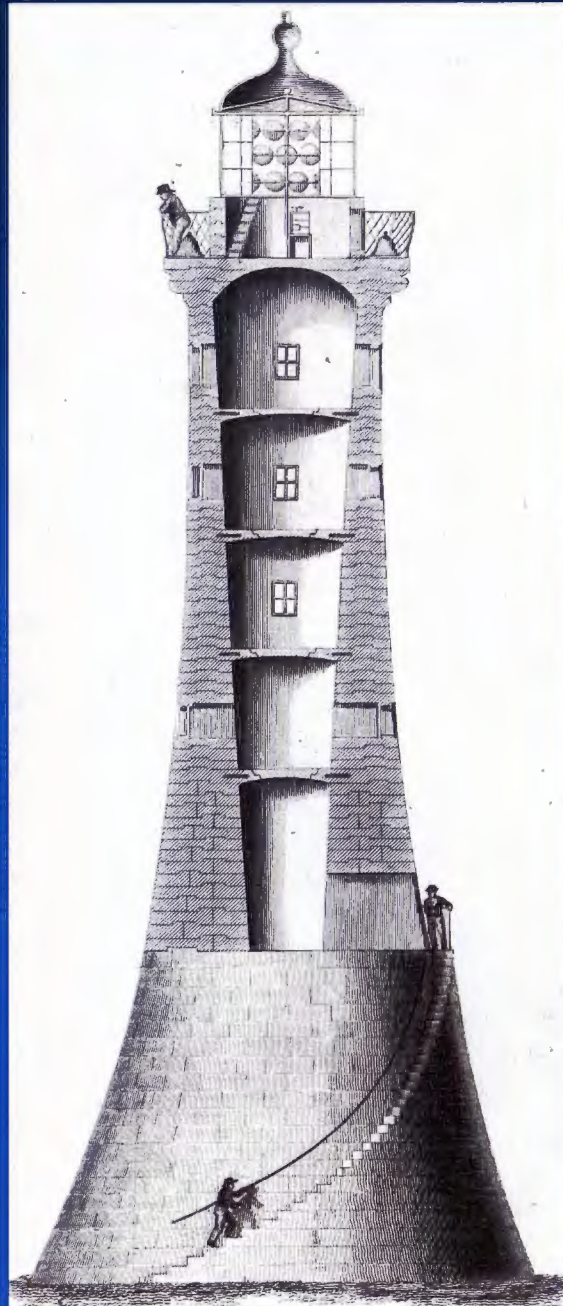


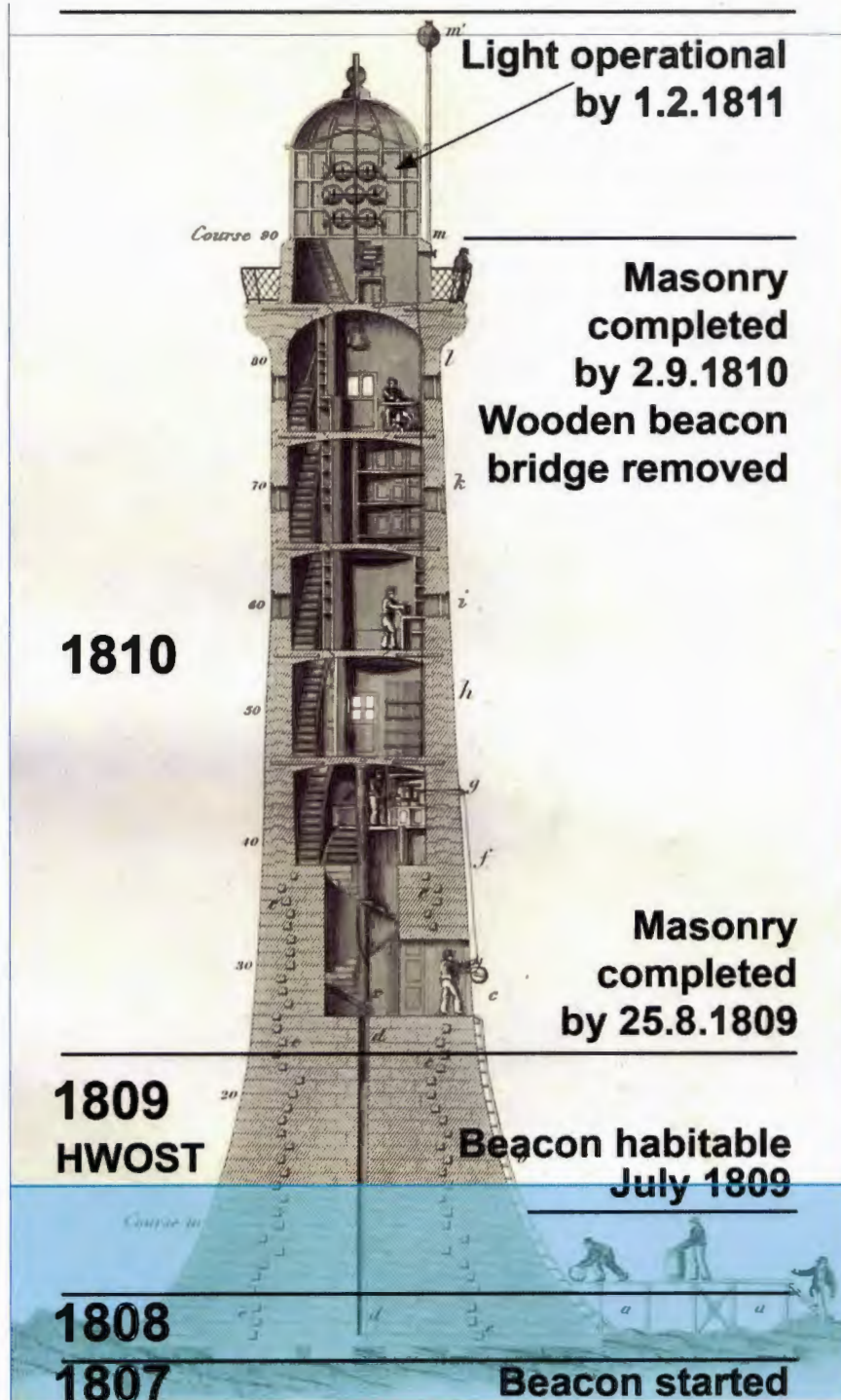
Leith docks entrance lock as preserved in 2010



Leith docks in 1838 – note Rennie's entrance lock and docks (left) and dry dock (right)

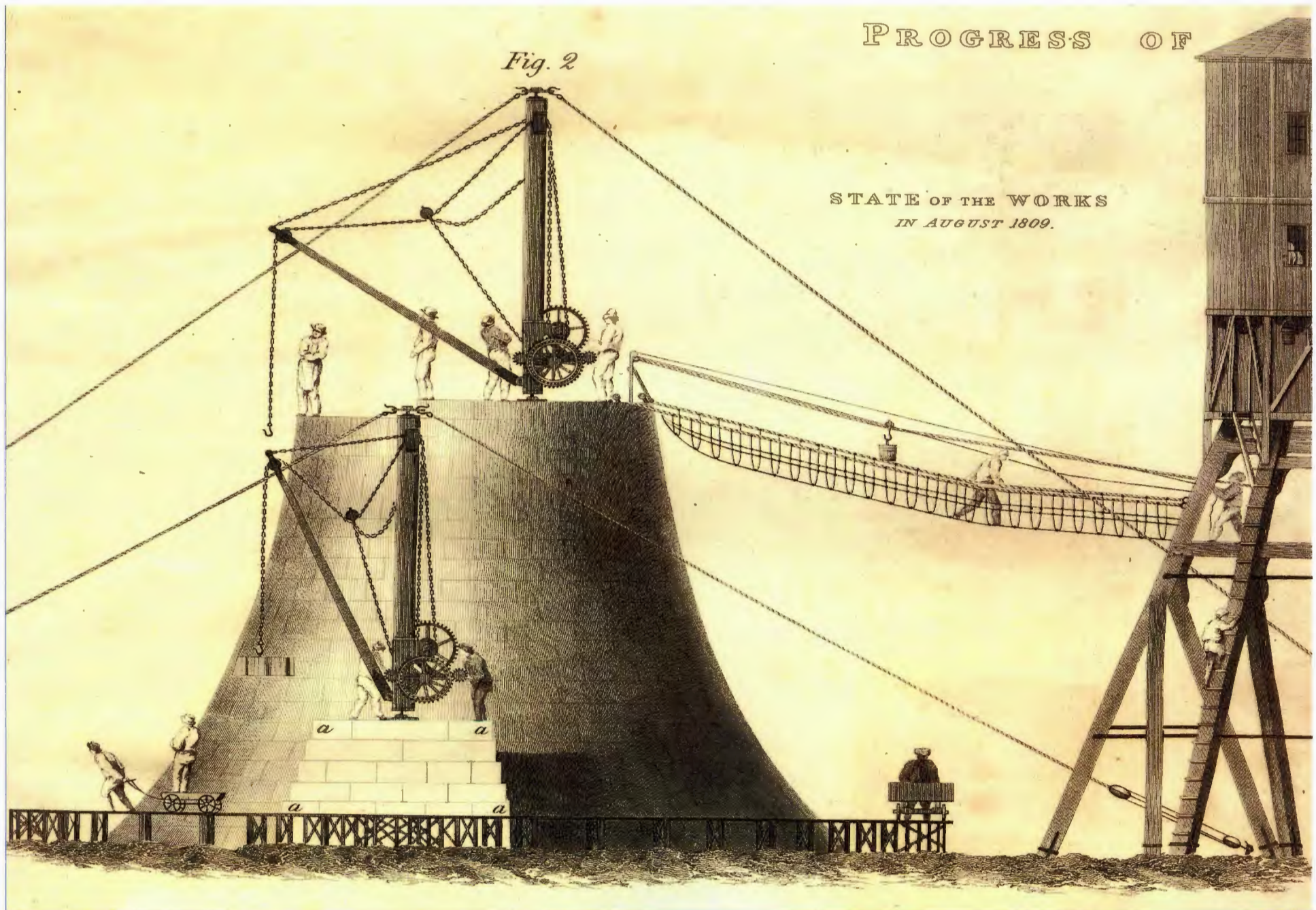
Bell Rock
Lighthouse -
Stevenson's
design (left)
1800-06
and
as-built
under
Rennie
as Chief
Engineer
1807-10
(right)





Bell Rock Lighthouse as erected 1807-11. Slow progress until beacon built alongside, then completion of masonry in 13 months





Bellrock Lighthouse progress 1809 – note innovation



Bellrock Lighthouse kitchen – note floor dovetailing



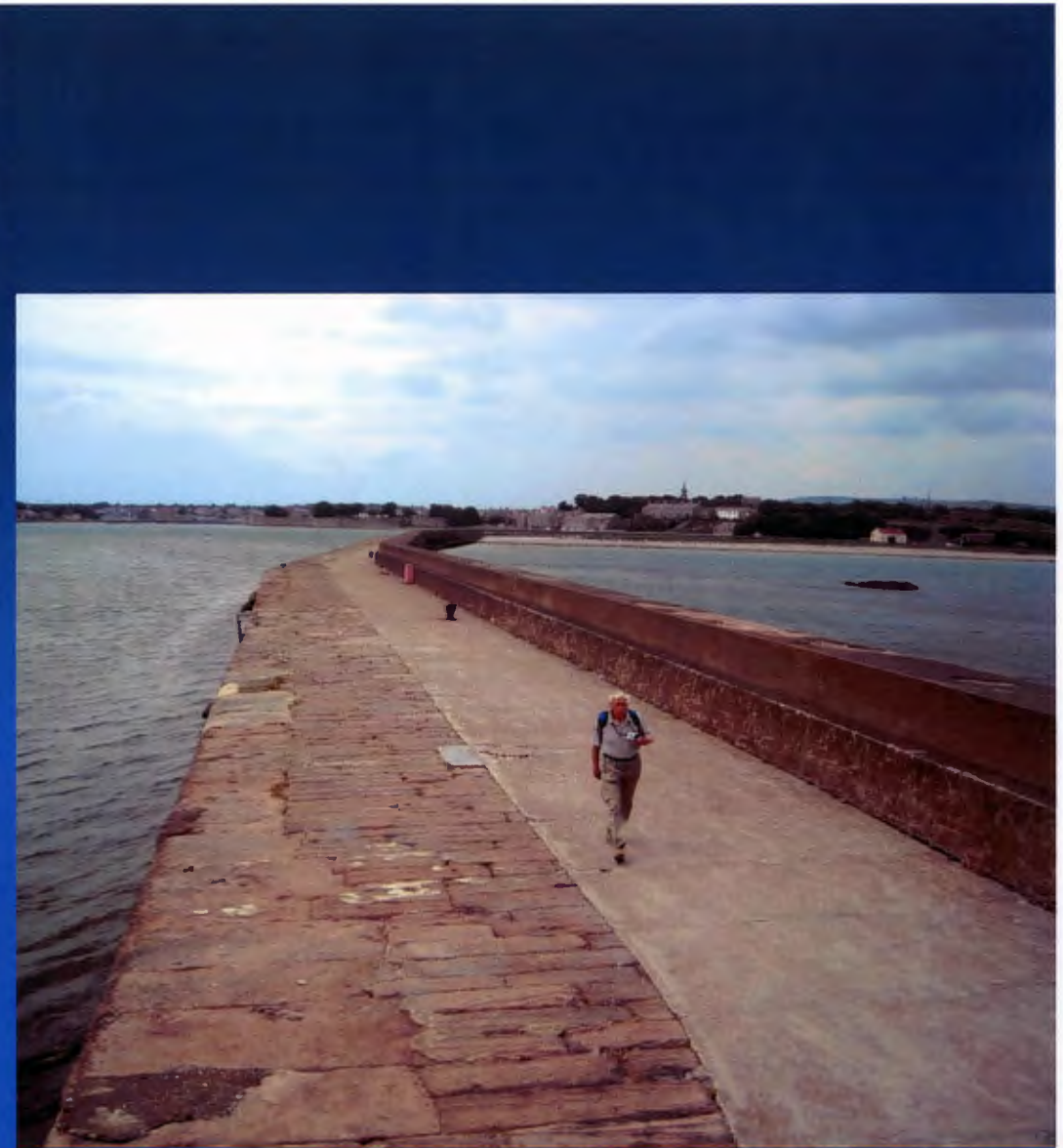
Dynasty of Engineers

The Stevensons and the Bell Rock

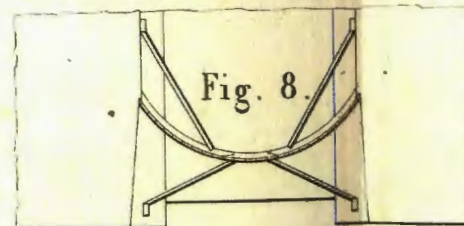
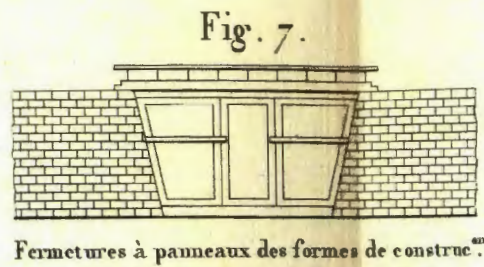
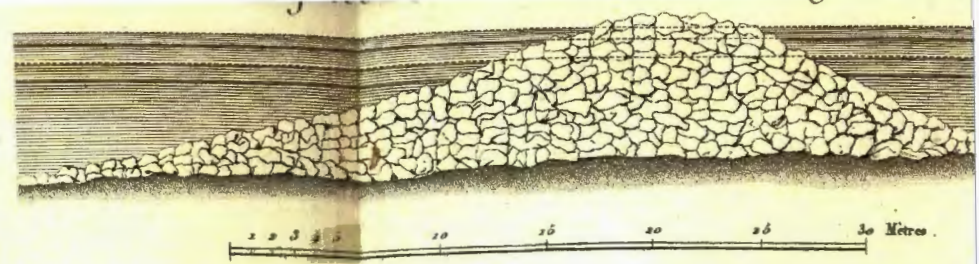
Roland Paxton

*Dynasty of
Engineers*
The Stevensons and
the Bell Rock

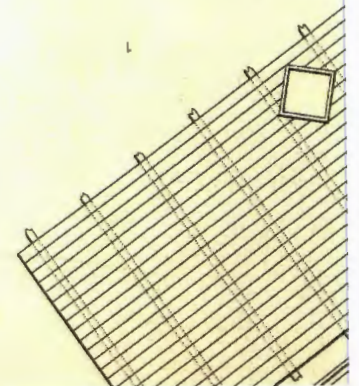
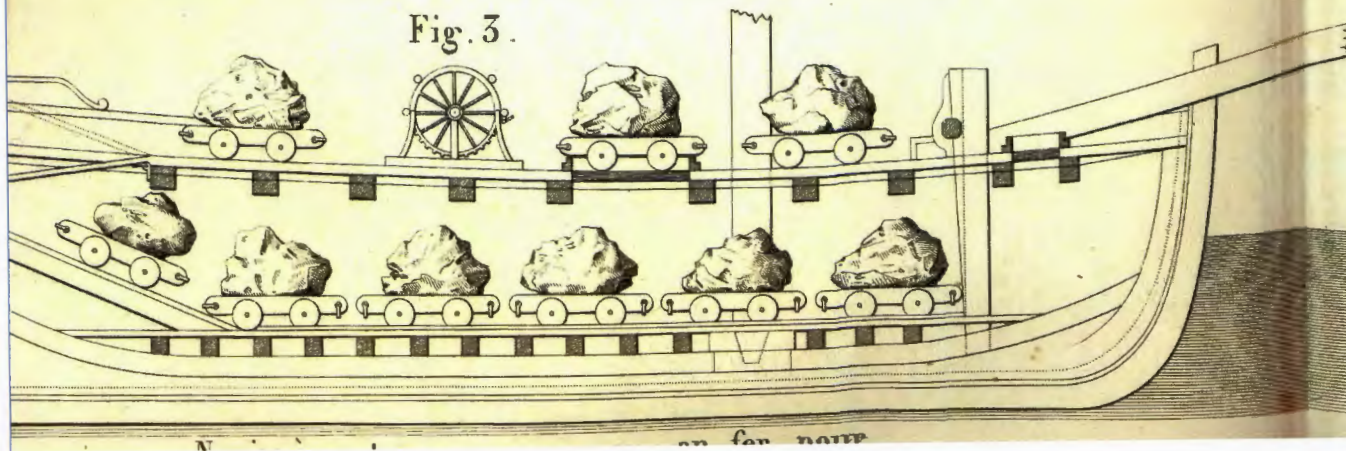


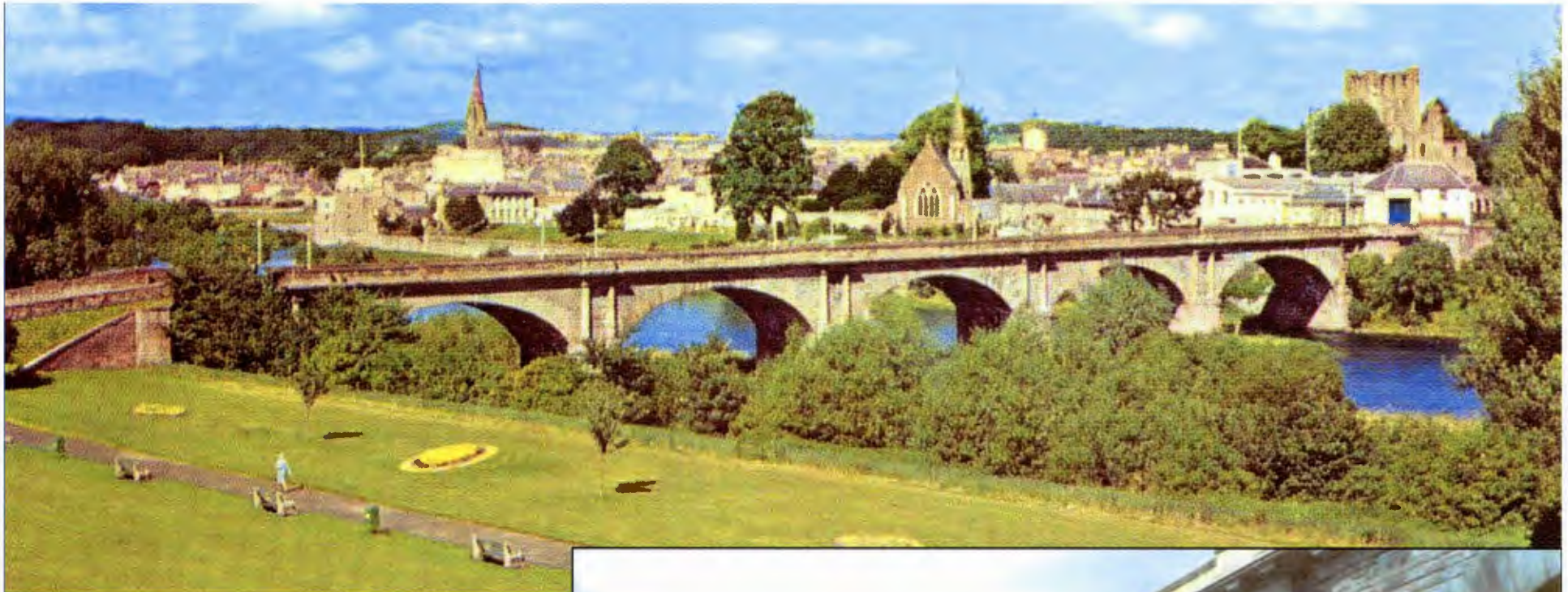


Rennie's Berwick Pier and lighthouse 1808-24. About 30 ft
Wide and 2000 ft long cost £63,000 – still in service



Plymouth Breakwater 1812-47



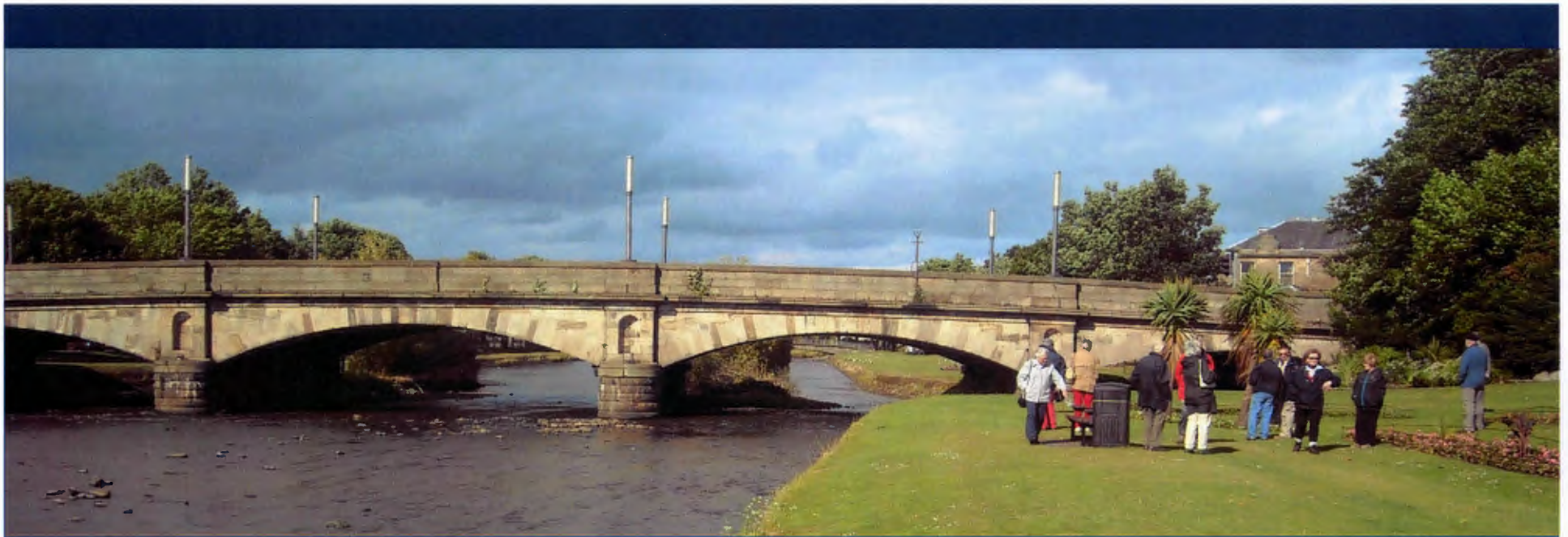


Kelso Bridge 1801-04
72 ft spans (elliptical)





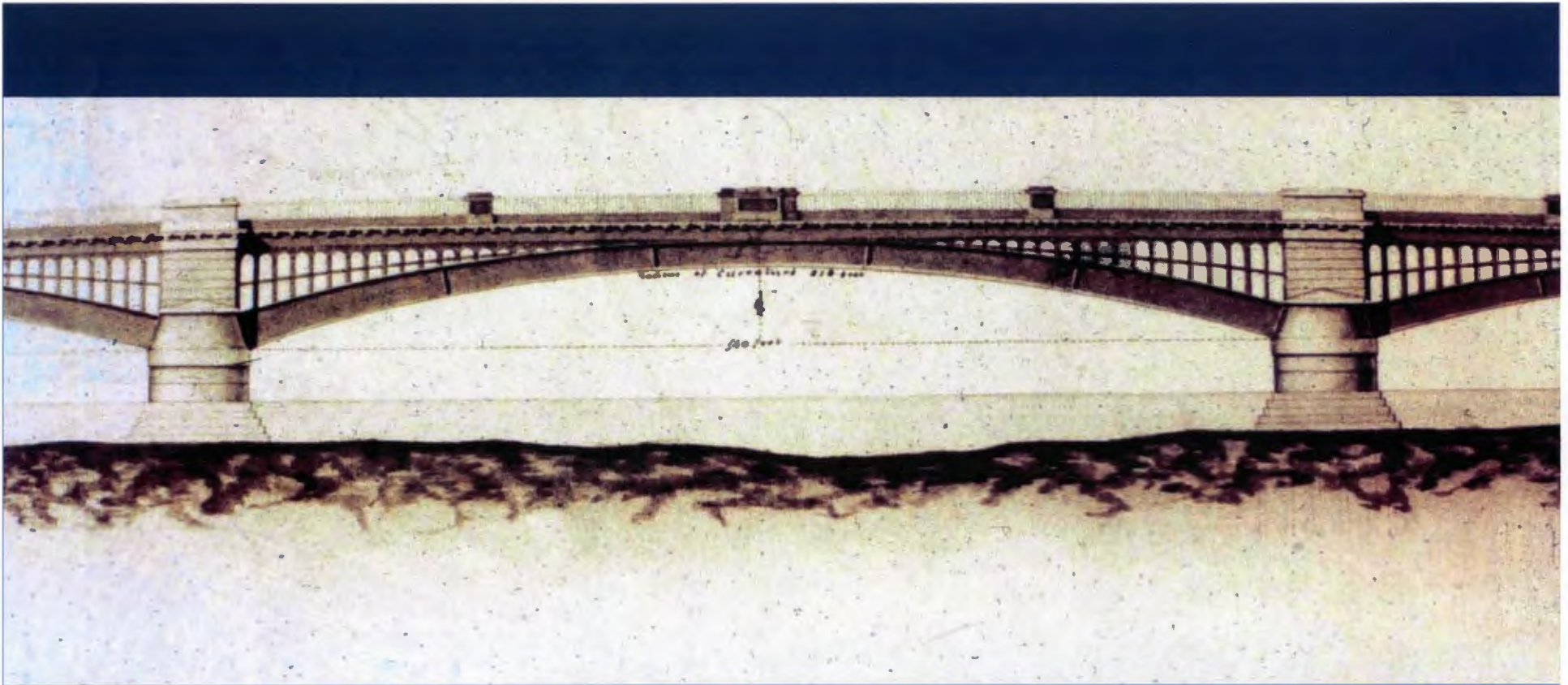
Musselburgh Bridge 1806-8 widened in 1925 on downstream side by Blyth & Blyth, Edinburgh



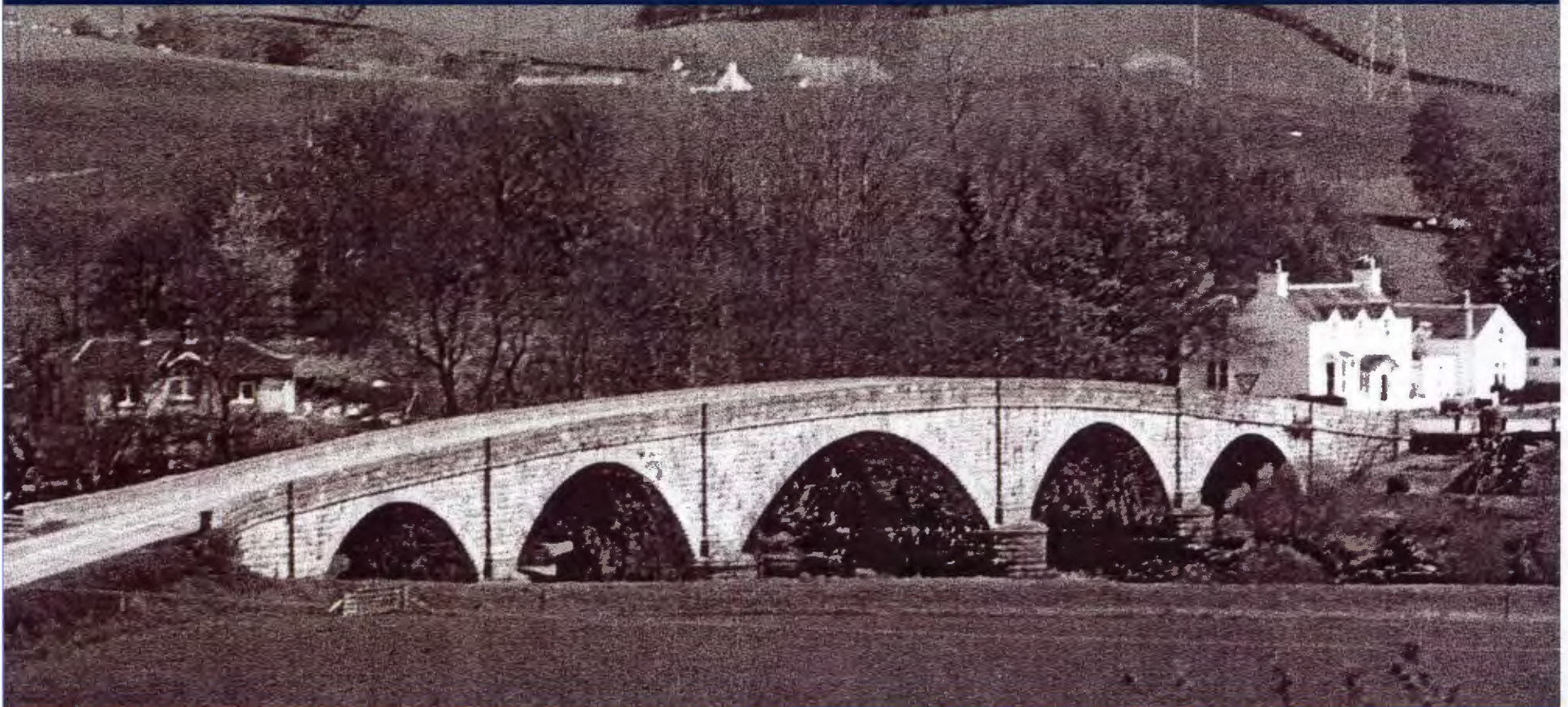
Musselburgh Bridge 1806-8 in 2010



Cree Bridge, Newton Stewart 1812-14 – cost £8234



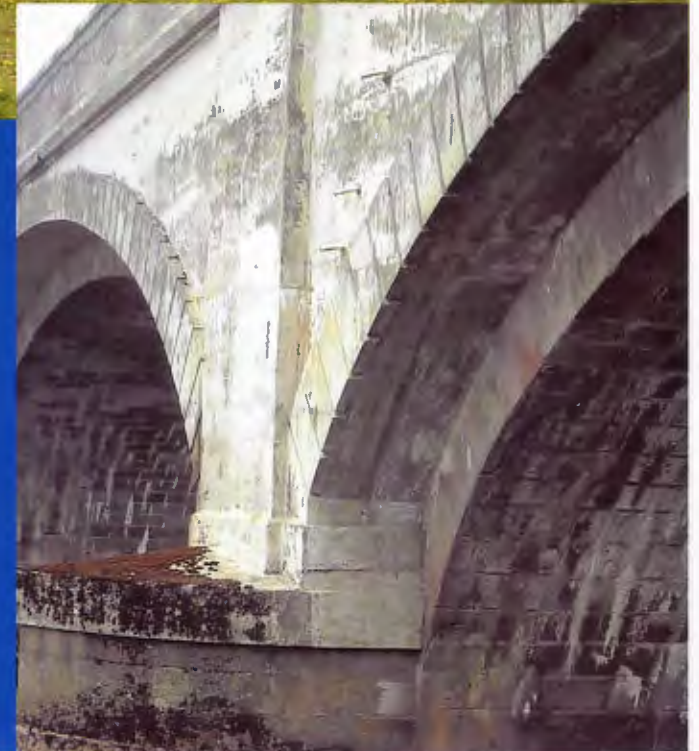
Glasgow, R. Clyde, Hutcheson Bridge Proposal 1815
(120 ft – 140 ft- 120 ft spans: ribs 48-66 ins deep)



Ken Bridge, New Galloway (90ft. max) 1820-24. Extensive water - way as earlier bridges destroyed by floods in 1806 and 1815



Rennie's Bridge of Earn 1819
as widened with concrete in
1925 retaining the elliptical
shape of the original arches
visible under the bridge





Union Bridge, Paxton 1819-20. Rennie advised on the strengthening of the tower and abutment. Capt. Brown, Engineer
The world's oldest suspension bridge still carrying vehicles

Pont de Southwark. à Londres.

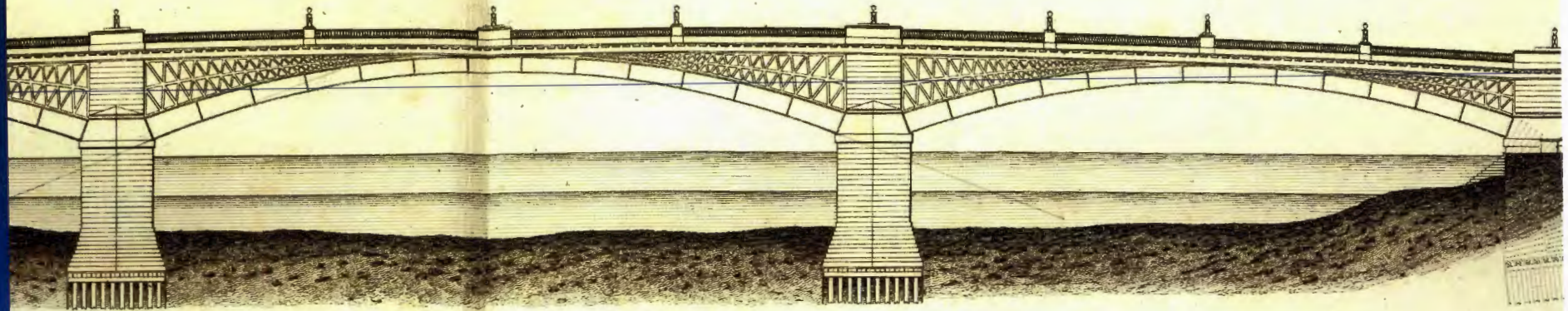


Fig. 2.

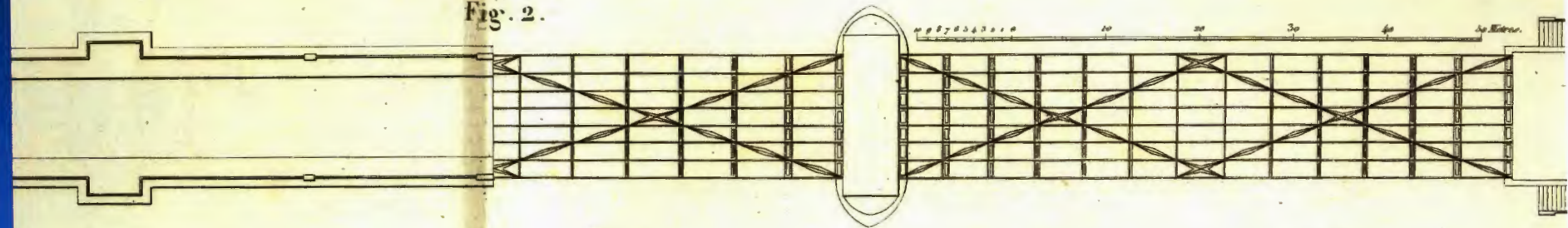


Fig. 4.

Fig. 5.

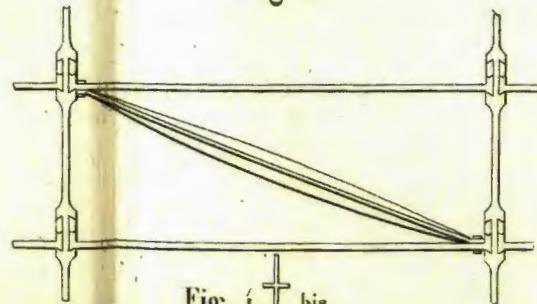
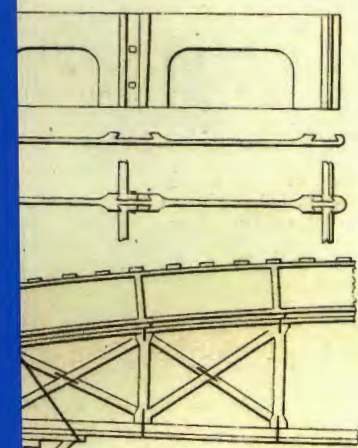
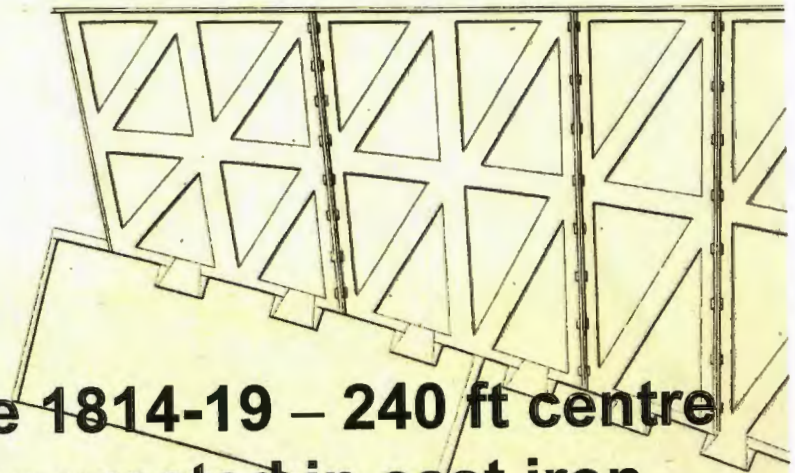
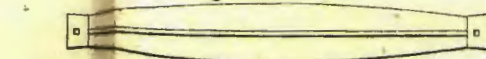
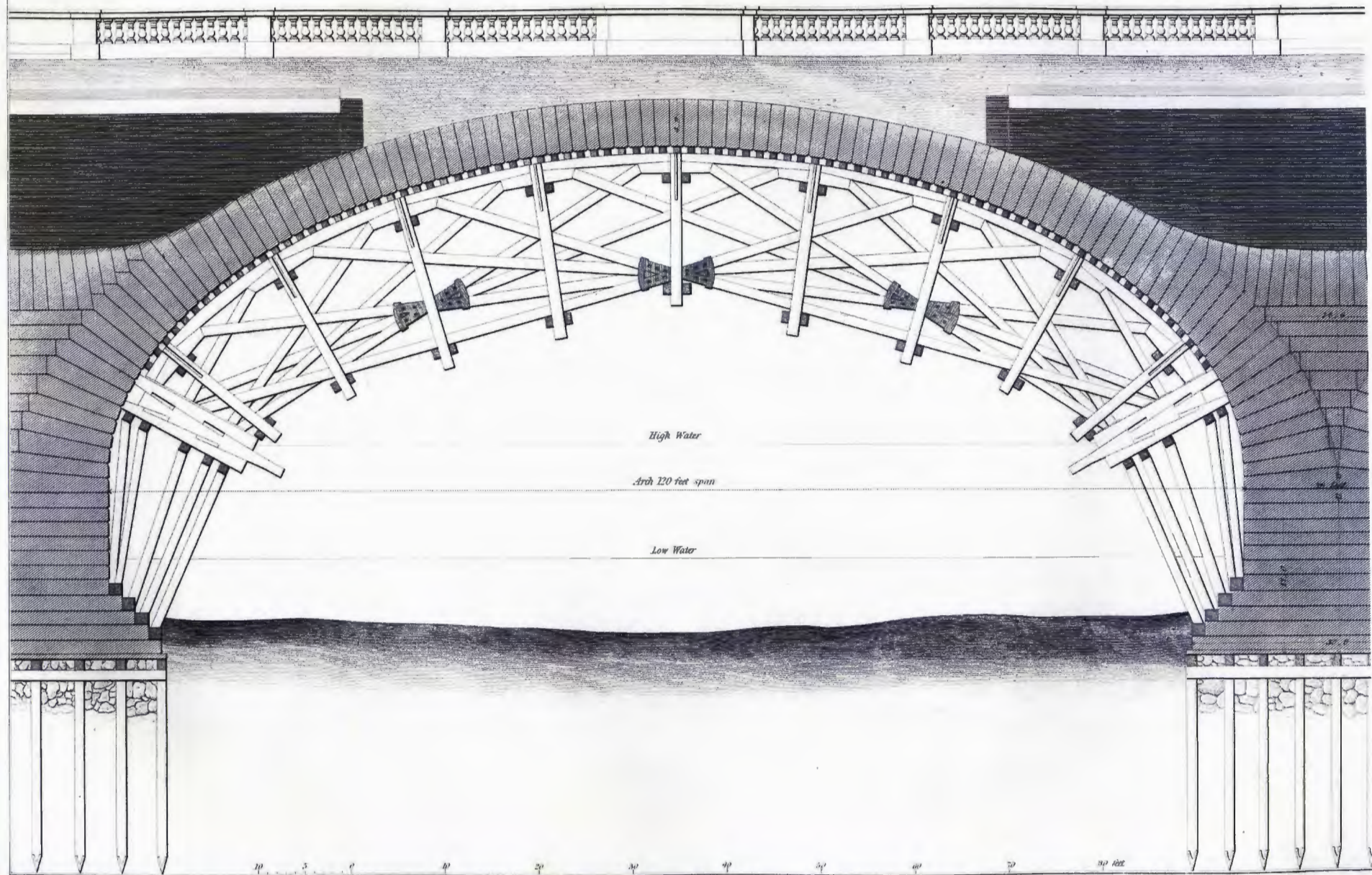


Fig. 4. bis.

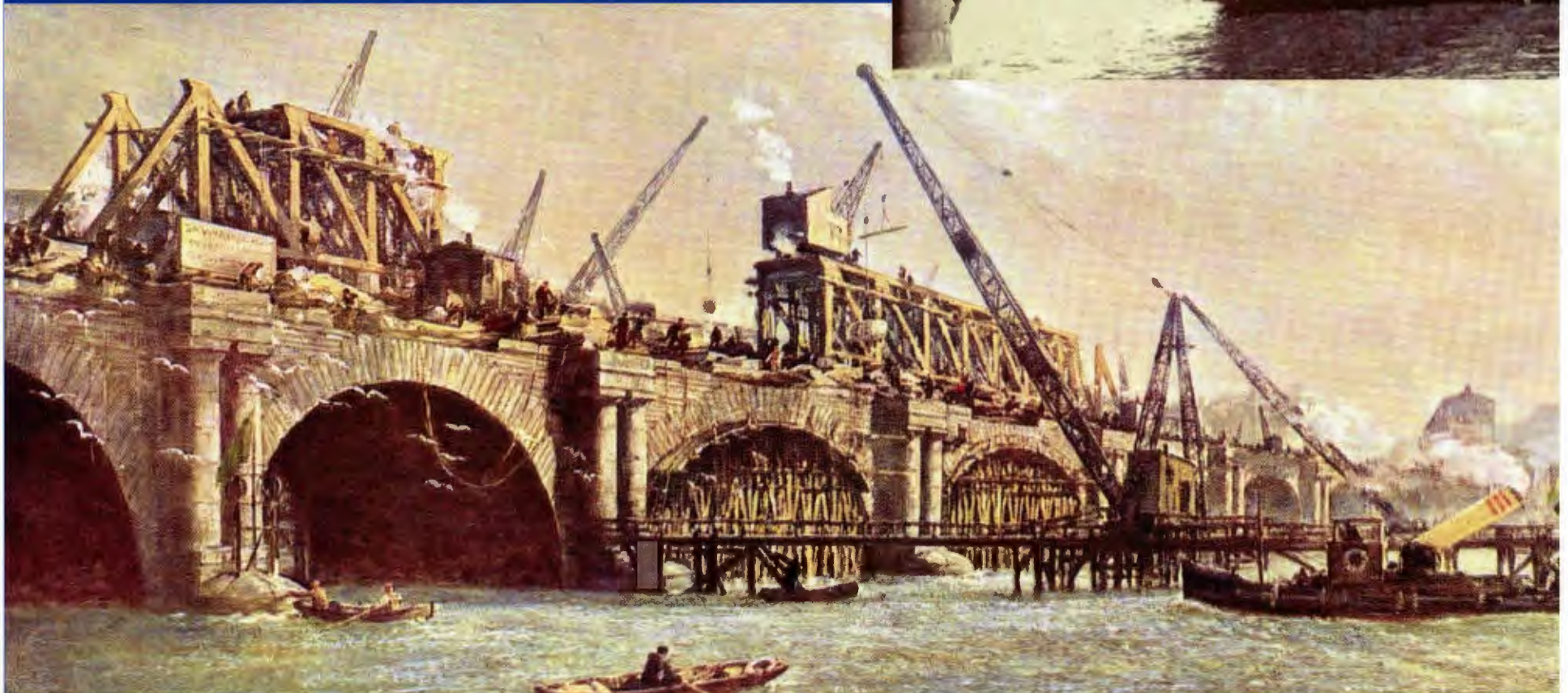


**Southwark Bridge 1814-19 – 240 ft centre span - largest ever erected in cast iron.
Weight c.5400 tons - cost £0.66m**



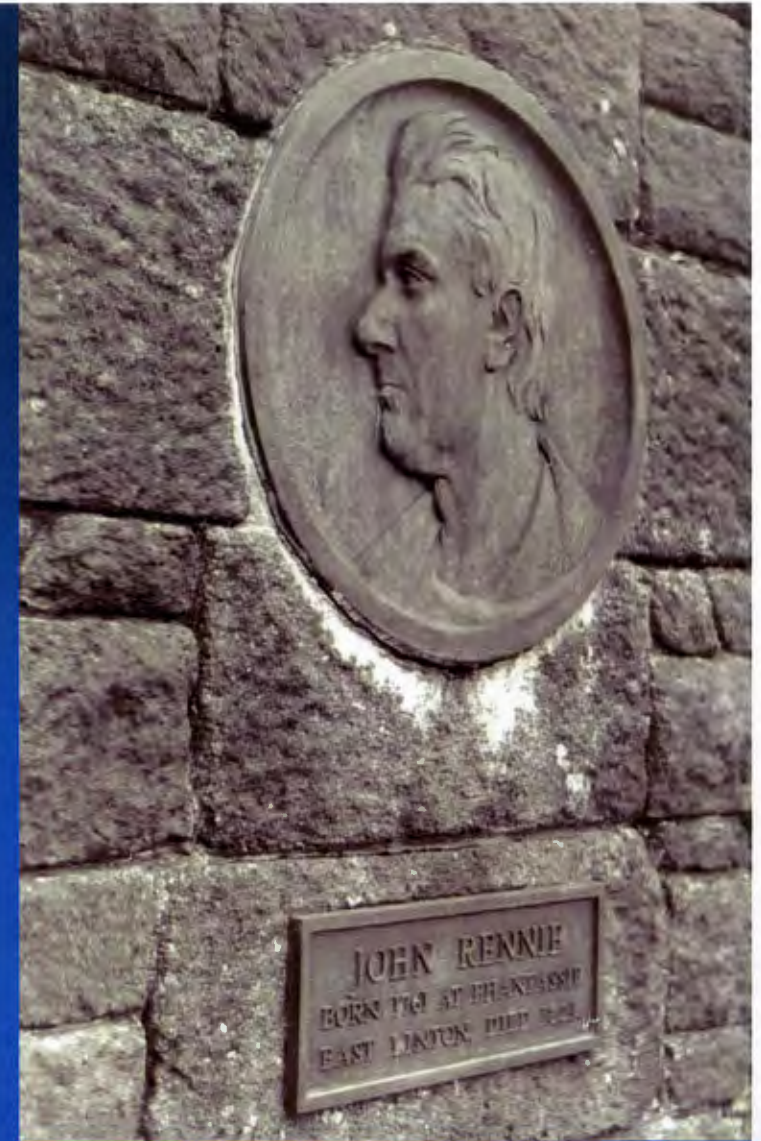
Rennie's Waterloo Bridge London - with its timber centering

Waterloo Bridge 1811-17 – then *the finest bridge in Europe*, cost £1M. Note balusters. Under demolition from 1934, note temporary spans. Rennie also designed new London Bridge in 1821- built after his death





London Bridge opened 1831 cost £2.5m. 150 ft span arches.
Sold in 1968 for \$2.5m now at Lake Havasu City in Arizona



Rennie Memorial, East Linton, including Waterloo Bridge baluster (not seen) and James Rennie, at its relocation at Phantassie in 1981 (left). 1936 memorial on bypass (right)