

[L. Jewitt (1873) *Plymouth*, 123R.N. Worth (1890) *History of Plymouth*, 439–450; C. Gill (1966) *Plymouth, A New History*, 204–205; H. Harris (1966, 1972) *Industrial Archaeology of Dartmoor*, 136–137]

Works

1591. The Plymouth Leat (Drake's Leat), £200 (construction)

LANDALE, Charles (1764–1834), civil engineer of Dundee and Charlestown, Fife, was christened at St. Andrews on 12 February 1764. His father was David and his mother Christian Campbell. Landale, said to have been formerly an apothecary, had by 1814 obtained sufficient experience to be taken on and serve for two decades as engineer for Lord Elgin's extensive limestone quarrying and coal mining interests in and around Charlestown and Dunfermline. His work for Lord Elgin included a plate-way to Charlestown harbour on the Firth of Forth, via a long inclined plane with a three-span masonry viaduct, together with improvements to the harbour and, c. 1820, the upgrading of the 6-mile 'Elgin Railway' with edge-rails and the construction of the 'much admired' Pittencrieff and Colton inclined planes near Dunfermline following a survey and approval of plans by Robert Stevenson (q.v.). A passenger service operated between Dunfermline and Charlestown from 1833. Landale's work is characterised by ingenious conveyances, plant and mechanisms. From 1825, with his nephew, David Landale, he also superintended the Wemyss and Methil collieries.

An unusual assignment c. 1818 involved the relocation of the monument to Charles, Earl of Elgin (d. 1771) at the Abbey Church, Dunfermline. During operations the side of a stone vault collapsed to reveal the near 500-year-old remains of Elizabeth, Queen of Robert the Bruce. Landale obtained some of the Queen's long red hair which in 1841 was of great interest to Dunfermline antiquarians. Landale was engaged by Lord Elgin c. 1813 at an annual salary of £250 plus the use of a horse and expenses. From January 1825 to July 1834, when he was much employed elsewhere, his annual salary reduced to £150, but the accumulated sum of £1,425 was not paid until 1836, two years after his death.

Landale also improved Scotland's oldest wagonway, from Tranent colliery to Port Seton, Cockenzie, in East Lothian, the track of which had been re-laid with cast iron rails in 1815. In 1821 the line was extensively remodelled with two inclined planes under the direction of 'the ingenious Mr. Landale of Dundee'. By 1825, when he was employed to make proposals for a railway from Dundee across the Sidlaw Hills to the Vale of Strathmore, he probably had had more experience of horse-traction railways and steam-operated and self-acting inclined planes than any other engineer in Scotland.

With the approval and support of Mathias Dunn (q.v.), colliery viewer, implementation of Landale's Dundee & Newtyle railway proposal, with its three steam-operated inclined planes, commenced early in 1827. Unfortunately Landale was unable to manage the project within budget for reasons some of which were beyond his control and in July 1829 the directors replaced him as principal engineer by George Lish, who completed the line in 1832. The railway was extended to the harbour in 1837 and cost in all about £70,000.

In September 1829, following publication of a letter explaining his conduct, Landale seems to have been retained by the railway company in an advisory capacity, but his reputation and health declined. His railway layout, whilst satisfactory for horse-traction, proved inconvenient and expensive to operate when steam locomotion was introduced in 1833. Although the railway never made a profit it was much used. By c. 1840 it was carrying some 70,000 passengers and 50,000 tons of goods per annum.

In 1824 Landale, based on his experience of harbour work at Charlestown, put forward a £60,000 proposal for the improvement of Leith harbour involving a 1,450 yd. extension of the existing pier and a new west pier from Trinity over a mile in length. The piers would have consisted of deposited rubble breakwaters about 50 yd. wide at the base and terminated in a harbour entrance 167 yd. wide, flanked by lighthouses, much on the layout of the eventual development of the harbour by 1942. No work was executed.

Landale, who is believed to have been unmarried, had a brother, John, who was the father of David Landale (1806–1895), mining engineer of Burntisland. In summer 1834, although in poor health, Landale went to the continent to conduct railway surveys for a German nobleman. He died at London on 8 November 1834.

ROLAND PAXTON

[Landale's engineering notebook, drawings and other records held by Lord Elgin at Broomhall, Dunfermline; Dundee City Archives; D. McNaughton (1986) *The Elgin and Charlestown Railway*; N. Ferguson (1995) *The Dundee and Newtyle Railway*]

Publications

? [Report on improvement of Leith Harbour, Edinburgh]

1825. *Report ... to ascertain whether it is practicable and expedient to construct a Railway between the Valley of Strathmore and Dundee ...*, 16 September 1825; also, *Observations upon the Line of Railroad by Matthias Dunn*, 1 October, 1825

1829. *Letter to the Committee of the Dundee and Newtyle Railway Company ... and ... Excerpts from Letters of the celebrated Smeaton, * relative to the Duties of Committees and Engineers on Public Works* [*to Redmond Morris, 1773]

Works

c. 1814–1834. Elgin Railway, Charlestown Harbour and other work for Lord Elgin 1825–1832. Dundee & Newtyle Railway

LAPIDGE, Edward (1779–1860), architect, was the eldest son of Samuel Lapidge. His father worked under Lancelot 'Capability' Brown (q.v.), eventually becoming head gardener at Hampton Court. Lapidge's architectural practice was concentrated in the Home Counties, including a number of gothic churches. His civil engineering work arose from his appointment as County Surveyor for Surrey in 1824. Shortly afterwards, in 1825, Kingston Corporation obtained an Act for a new bridge to replace the existing timber bridge which was in a very dilapidated condition and Lapidge became responsible for its design, a masonry structure, with Portland stone facings, of five elliptical arches and small flood arches at each end. The contractor was William Herbert. Work began in November 1825 and the bridge was opened by the Duchess of Clarence on 12 July 1828. It has been suggested the design was influenced by the style of Capability Brown. The bridge is Lapidge's chief claim to fame. Lapidge offered a similar design for a bridge at Staines but that of George Rennie (q.v.) was preferred. Lapidge's only other bridge was that at Betchworth (1842), although as County Surveyor he would have been consulted about the maintenance of others. In 1850 he also exhibited at the Royal Academy his own system for a suspension bridge. As Surrey County Surveyor he was responsible for a number of buildings and road surveys. He also entered a number of architectural competitions but with little success.

Elected a Fellow of the (Royal) Institute of British Architects in 1838 his pupils included George Wightwick and H. H. Russell. He died in February 1860 and is buried in Hampton Wick.

MIKE CHRIMES

[Quarter Session Records, Surrey County RO; G. Phillips (1981) *Thames Crossings*; Bendall; Colvin (3)]

Works

Works include:

1825–1828. Kingston Bridge, £31,000 (tender)
1842. Betchworth Bridge

LARKIN, Nathaniel John (fl. 1825–1827), teacher of mathematics and crystallographer, was born in London on 5 December 1781. He was appointed (second paid) Secretary of the Institution of Civil Engineers in January 1825. He was required to post £100 security on appointment and was entitled to 30 guineas per session plus 5% of all subscriptions collected. At that time his duties involved attending evening meetings in the session and Council meetings during the recess, but at the end of the year enlarged premises were taken over at 15 Buckingham Street with a view to

having a resident secretary. Larkin, then living at Gee Street, Somers Town, and with other responsibilities elsewhere, resigned, being succeeded by William Rutt (q.v.). Larkin was elected an Associate in 1826 but remained in membership only for a short time. From 1820 he was a member of the Geological Society.

TESS CANFIELD

[Membership records, ICE archives; *Larkin, Nathaniel John*, in F. Boase (1892–1924) *Modern English Biography*; J. G. Watson (1988) *The Civils*, 199–200]

Publications

1810. *An Essay on a Species of Mosaic Pavement formed of Right angled Triangles of different Colours*

1820. *An Introduction to Solid Geometry, and to the Study of Crystallography, containing an Investigation of some of the properties belonging to Platonic Bodies independent of the Sphere*

? *Rudiments of Linear, Plane, and Solid Geometry*

LATROBE, Benjamin Henry (1764–1820), architect and engineer, was born at Fulneck, near Leeds, the second son of the Reverend Benjamin Latrobe and Anna Margareta, *née* Antes. His father was the head of the Moravian congregation in England and moved to London in 1768 but his son was educated at the Moravian school in Fulneck until, in 1776, he was sent to the Moravian seminary at Niesky (Silesia) and Barby (Saxony). His education included elements of mathematics and science which were to underpin his subsequent career in engineering. Around 1781 Latrobe briefly studied with the Saxon hydraulic engineer, Riedel, before touring Europe in 1783. In August that year Latrobe returned to London where he obtained a sinecure at the Stamp Office.

What is known about Latrobe's early training as an engineer and architect is largely derived from subsequent references in his correspondence. It has been suggested that Latrobe was a pupil of John Smeaton (q.v.) but this is unlikely as his return to England coincided with Smeaton's effective retirement. It would seem that Latrobe probably worked for Smeaton's best known former pupil William Jessop (q.v.). Latrobe's reference to securing work on the Fens could perhaps refer to work at Knights Gool on the Ouse, or on the Trent, or Hatfield Chase, where work was ongoing at the time. Clearer are references to work at Rye Harbour (1786–1787) and on the Basingstoke Canal (1787–1789). For reasons that are unclear, as there was an abundance of work for engineers at the time, Latrobe then began work as a draughtsman for the architect, Samuel Pepys Cockerell. By 1792 he was married to Lydie Sellon and in private practice as an architect working on private houses, and was also surveyor to the London Police Offices. It is as an architect, in England, and, more importantly in the United